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User's Guide for the Augmented Computer Exercise for Inspection Training (ACE-*IT*) Software

Pauline R. Dobranich, Karl E. Horak, David Hagan, Deborah Evanko, Jon Nelson, Christine Ryder, Dana Hedlund

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USER'S GUIDE FOR THE AUGMENTED COMPUTER EXERCISE FOR INSPECTION TRAINING (ACE-*IT*) SOFTWARE

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ABSTRACT

The on-site inspection provisions in many current and proposed arms control agreements require extensive preparation and training on the part of both the Inspection Teams (inspectors) and Inspected Parties (host). Current training techniques include table-top inspections and practice inspections. The Augmented Computer Exercise for Inspection Training (**ACE-*IT***), an interactive computer training tool, increases the utility of table-top inspections. **ACE-*IT*** has been designed to provide training for "challenge inspections" under the Chemical Weapons Convention (CWC); however, this training tool can be modified for other inspection regimes. Although **ACE-*IT*** provides training from notification of an inspection through post-inspection activities, the primary emphasis of **ACE-*IT*** is in the inspection itself — particularly with the concept of "managed access." **ACE-*IT*** also demonstrates how inspection provisions impact compliance determination and the protection of sensitive information. This User's Guide describes the use of the **ACE-*IT*** training software.

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EXECUTIVE SUMMARY

Many current and proposed arms control agreements have on-site inspection requirements. Either government facilities or private firms may be subject to these inspections. The Augmented Computer Exercise for Inspection Training (**ACE-*IT***) is a tool for training both inspectors and hosts.

ACE-*IT* is an interactive computer program. It teaches users (1) how to conduct an inspection and (2) how the provisions of an on-site inspection affect the ability to determine compliance and protect sensitive information. **ACE-*IT*** has been developed for practicing a "challenge inspection" under the Chemical Weapons Convention (CWC).

"Challenge Inspections" may occur at anytime and anywhere—without the right of refusal and with little advance notice. Therefore, advance training is important.

ACE-*IT* training is conducted with the trainees divided into two teams: an "Inspection Team" (inspectors) and an "Inspected Party" (hosts). An exercise moderator controls the exercise. The training includes all of the events allowed by the CWC, from notification of an inspection through post-inspection procedures.

This user's guide is intended to provide a step-by-step summary of the events that take place during a simulated inspection. The guide is written in sufficient detail to permit both instructors and trainees to "walk through" any or all phases of a training exercise. Therefore, this guide can be used by the exercise instructor (moderator) to become familiar with all the possible situations that may arise during the inspection simulation.

Overview of Technical Information

Control Module

The control module (see Figure E-1) shows the schedule for the "challenge inspection." The time that would be required for an actual inspection is compressed for the training exercise. All events are automatically recorded in an inspection log, and users may also add their own notes. The moderator may pause the exercise or jump ahead to the next scheduled event.

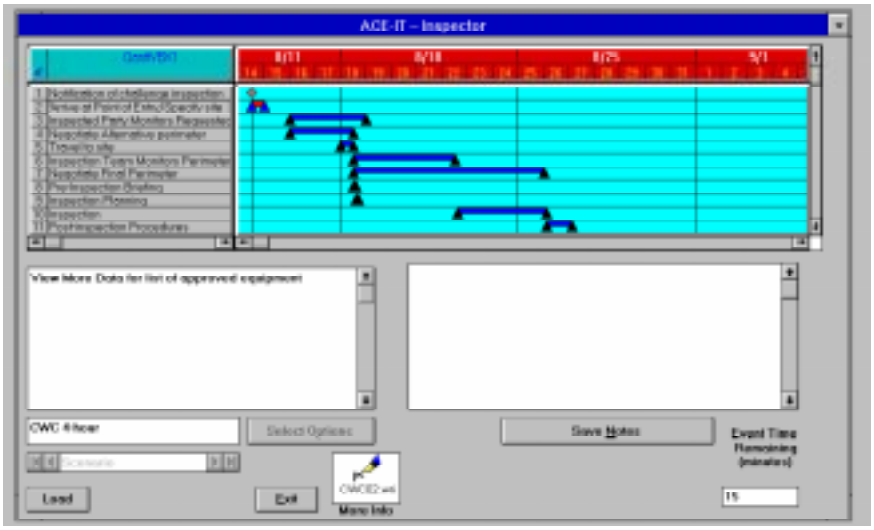


Figure E-1. ACE-*IT* Schedule of Events for the "Challenge Inspection."

Geographic Information System (GIS) Building Maps

There are three buildings available for inspection: a "single small-scale facility," an office building, and a demonstration building. At the "single small-scale facility," a country produces Schedule 1 chemicals for research, medical, pharmaceutical, and protective purposes.

Interactive Menus

Interactive menus (see Figure E-2) allow the Inspection Team and the Inspection Party to "conduct" the inspection. These menus teach the important concept of *managed access* — i.e., how the Inspected Party can protect sensitive information that is unrelated to the CWC. This includes controlling physical access to a room, negotiating permission to look behind shrouds, and controlling requests for alternate information.

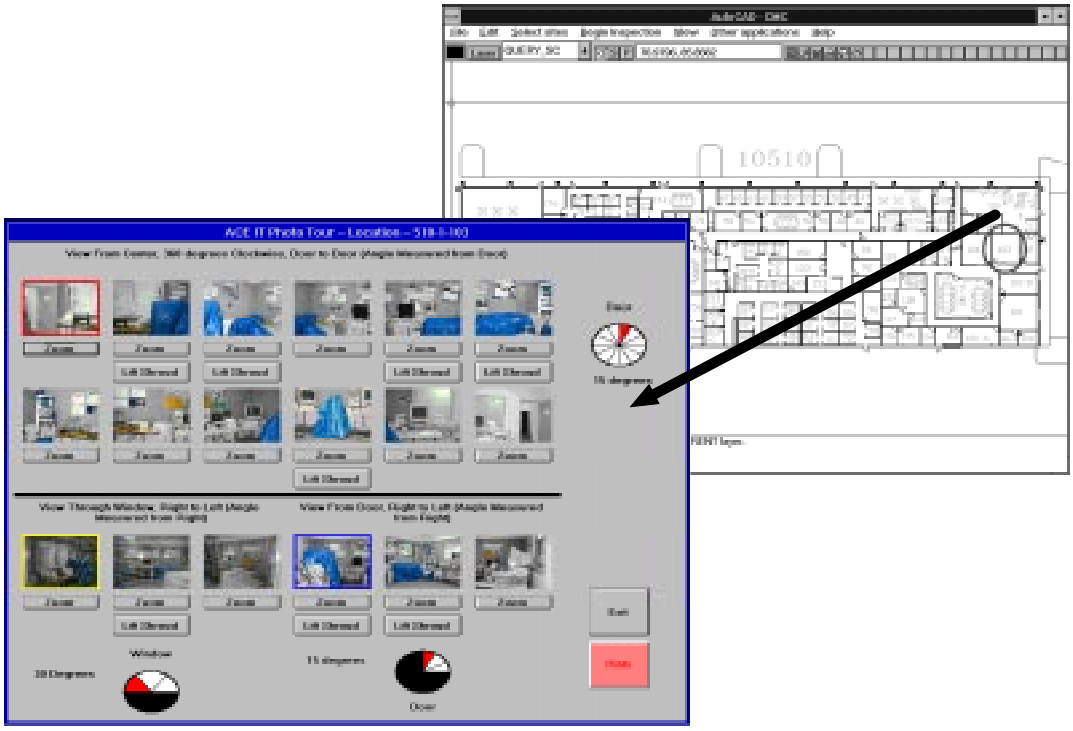


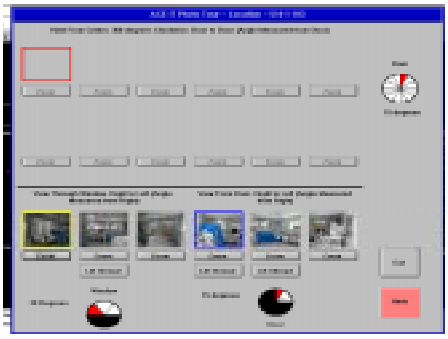
Figure E-2. Building Map and Interactive Menu with Digital Images of a Room

Digital Images

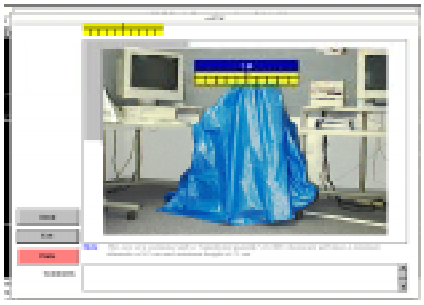
Digital images provide users with multiple views of each room. The images may be zoomed to full screen.

Tabular Data

The user can access data associated with each room, if permission to access this information is granted by the Inspected Party. The data include inventory of items in each room, chemical sampling results, proprietary research information, hazardous waste information, and other related documents.



Partial Access (View through window and door only)



Shrouded Item (Shroud not lifted)

Alternate Information Available

Shrouded Item (Shroud partially lifted)

Shrouded Item (Shroud completely lifted)

Figure E-3. Inspection Team Negotiations

Text Retrieval

Some documents are not associated with a particular location (CWC text and safety plans). These documents are displayed as hypertext documents or as electronic fax documents.

Additional Features

In addition to the interactive windows of the **ACE-*IT*** system, users are provided with a "Chat" feature, allowing them to hold discussions across the computer network. Each message is captured by the system for inclusion into the log.

Hardware and Software Requirements

ACE-*IT* consists of a suite of commercial software that runs on a local area network with three personal computers. Each computer is at least 486/66-class, with 32 MB RAM and 2 GB hard drive, capable of video display at a resolution of at least 1024 by 768. The operating system is Windows 3.11.

Custom applications have been developed to integrate the system components using several commercial products:

- AutoCAD® by Autodesk—graphics engine
- ArcCAD® by ESRI—geographical information system
- Access® by Microsoft—database
- ZyIndex® by ZyLAB—text retrieval
- Visual BASIC® by Microsoft—program development
- Windows for Workgroups by Microsoft—local area network

Other Applications

In addition to providing training in conducting "challenge inspections" under the CWC, **ACE-*IT*** can be used to study managed access techniques for other inspection regimes and manage time during an inspection. Other agreements, inspection regimes, and buildings could be added to **ACE-*IT***.

Availability of ACE-*IT*

All of the equipment and most of the software is commercially available. The customized code is protected by copyright, and available from Sandia National Laboratories and Ogden Environmental and Energy Services.

1.0 INTRODUCTION

The Augmented Computer Exercise for Inspector Training (**ACE-*IT*)** system is an integrated package designed to instruct Inspection Teams and Inspected Parties in the conduct of challenge inspections under the Chemical Weapons Convention (CWC). A challenge inspection scenario provides the training framework. The **ACE-*IT*** training package enhances standard training techniques, such as table top exercises and mock inspections by providing relevant information from a single geographically-oriented interface. The system is part of the program presented by the Cooperative Monitoring Center (CMC), Sandia National Laboratories, Albuquerque, New Mexico, which provides comprehensive training in inspection and monitoring techniques for international agreements.

The **ACE-*IT*** training system is conducted with two sets of participants, one representing the Inspection Team (inspectors), and one representing the Inspected Party (host). The exercise Moderator serves as an instructor and controls the flow of the exercise.

The **ACE-*IT*** training system not only includes the software discussed here, but also utilizes a variety of other training materials. Each team is provided with an "Exercise Manual" and will have access to video tapes, official copies of treaty or agreement text and other materials.

Starting the System

To begin the training exercise, all three computers in the **ACE-*IT*** system must be logged onto the local area network (LAN), and the proper network connections established. (For a detailed description of these settings and the contents of the initialization file, see Section 5.1.) Figure 1 shows the Program Manager window on the Inspected Party computer, which is the first window shown following system startup.

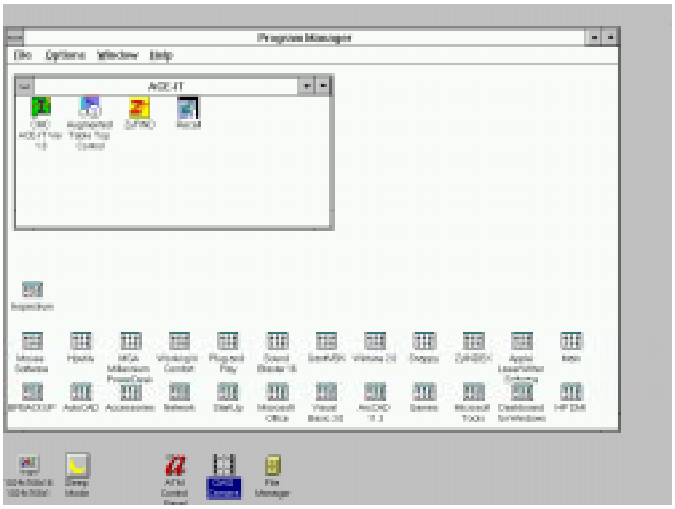


Figure 1. Windows 3.11 Program Manager with **ACE-*IT*** Program Window

There are three icons in this window that are common to all three computers. The icon labeled "CMC **ACE-*IT*** Version 1.0" activates the AutoCAD® map of the CMC site and automatically loads ArcCAD® if required. The icon labeled "**ACE-*IT*** Control Module" activates the control module specific to each computer. The icon labeled "ZyFIND" activates the hypertext software package ZyIndex®. The

Inspected Party's computer has an additional icon labeled "Recall", which allows the Inspected Party to review the last requested information during the inspection exercise.

To begin the exercise, double click on the CMC **ACE-*IT*** Version 1.0 icon, and allow AutoCAD® and ArcCAD® to complete their respective loading sequences. When AutoCAD® and ArcCAD® have completed loading, return to the Program Manager, and double click on the **ACE-*IT*** Control Module icon. The **ACE-*IT*** Control Module is the primary module for the system. During the exercise, it should not be closed without direct instruction from the moderator. This module provides an active timeline that will automatically progress through the exercise.

The Inspection Team and Inspected Party will see the window shown in Figure 2, below. The Moderator will see a different window, as shown in Figure 3. Each team should then click on the button labeled **LOAD** in the lower left corner of the window. The Gantt chart of the inspection schedule loads, and the exercise is ready to begin. Once each party is ready, the Moderator clicks on the **START** button, initiating the exercise.

The **ACE-*IT*** Control Module window presents a scenario and timeline based on a detailed analysis of the CWC requirements for challenge inspections. The exercise may be paused for other training activities, such as presentations, videos, and general discussions.

The **ACE-*IT*** Control Module window displays the inspection scenario timeline in the form of a Gantt chart, which is displayed at the top of the window. A display box located on the left side of the window below the Gantt chart provides a description of the current event.

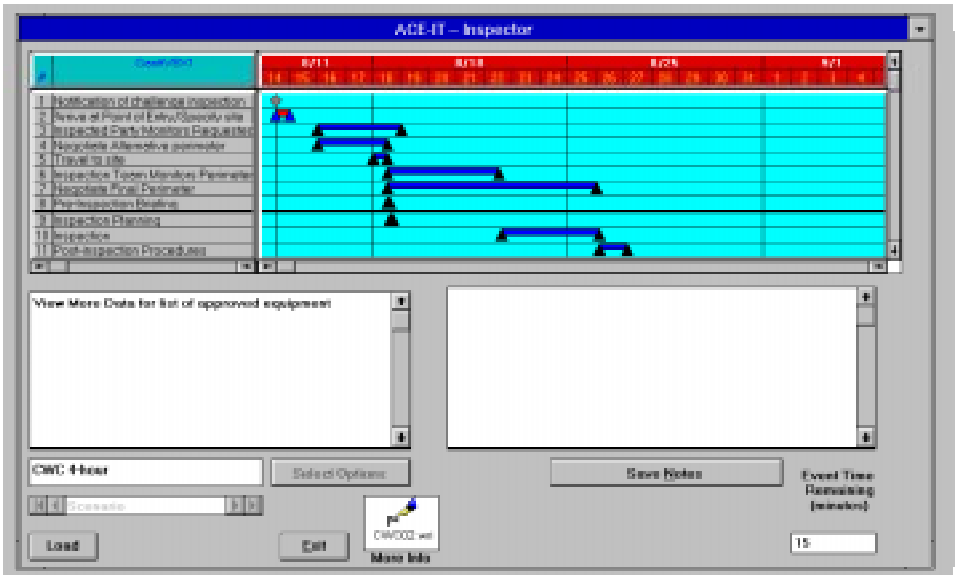


Figure 2. **ACE-*IT*** Control Module Window for Inspection Team and Inspected Party

The Inspection Team and Inspected Party also see a display box to the right, which allows them to enter notes and save them to the exercise log by clicking on the **SAVE NOTES** button. The time remaining in the current event is displayed in the lower right corner of the window. When minimized, the icon for this window continues to display the current event time remaining. A small box labeled **MORE INFO** is located in the bottom center of the window. Users can double click on this box to view a more detailed description of the event, which can also be printed. (See Figure 4.)

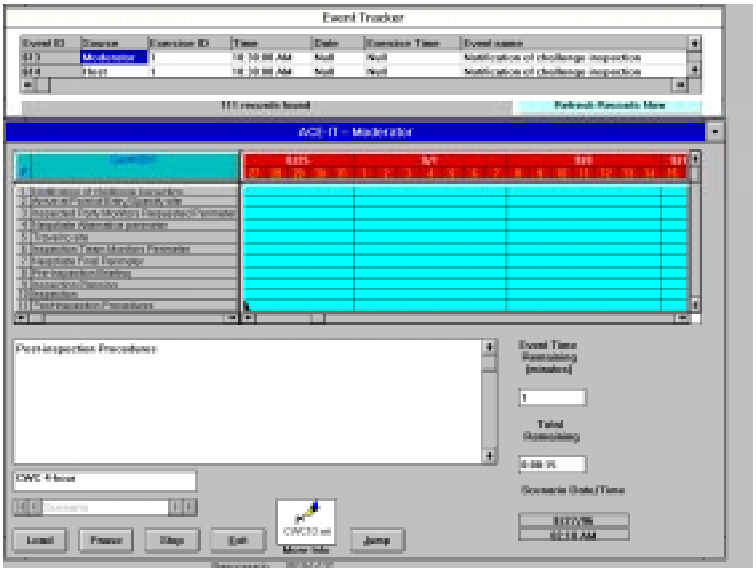


Figure 3. **ACE-*IT*** Control Module Window for Moderator

The Moderator is provided with some additional features: a button labeled **START**, which becomes **PAUSE** once the exercise has begun; a **JUMP** button, which allows the Moderator to move all users ahead to the next event in the sequence if they complete the current event before the allotted event time expires; and boxes that display both the Total Time Remaining for the entire exercise and the Scenario Date/Time, as defined by the Gantt Chart display of the challenge inspection schedule. The Event Tracker module actively tracks events as they are recorded to the Exercise Log, allowing the Moderator to monitor events as they occur.

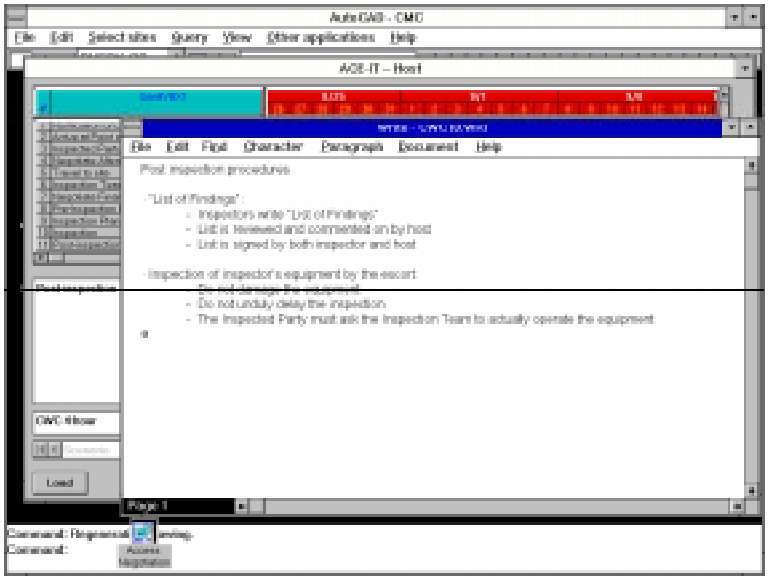


Figure 4. Windows® Write Document accessed from **MORE INFO** Button

2.0 DETAILS OF THE EXERCISE

This section provides a detailed outline of a training exercise, including the associated discussions, documents, training goals, and videos. Table 1 presents a side-by-side comparison of a CWC challenge inspection timeline with the exercise timeline, showing the maximum time allotted for each event. The Exercise timeline ensures that a training session on a CWC Challenge Inspection scenario can be completed in just four hours. Although the exercise scenario is true to an actual inspection, in that it contains all of the steps required to complete an inspection, some of the steps, such as *Travel to Site*, are not of primary interest in the training exercise. This step is allotted one minute of exercise time. The Moderator can move ahead to the next step any time using the **JUMP** button, or can pause the current step using the **PAUSE** button, provided on the **ACE-*IT*** Control Module.

Table 1. CWC/Exercise Timeline Comparison

Treaty Events	CWC Challenge Inspection (hours)	Exercise (minutes)
Notification of Challenge Inspection	—	—
Arrival at Point of Entry/Specify Site	12	15
Inspected Party Monitors Requested Perimeter	72	15
Negotiate Alternative Perimeter	60	30
Travel to Site	12	1
Inspection Team Monitors Final Perimeter	180	10
Negotiate Final Perimeter	96	10
Pre-Inspection Briefing	3	10
Inspection Planning	2	15
Inspection	84	120
Post Inspection Procedures	24	30

2.1 STEP 1: NOTIFICATION OF CHALLENGE INSPECTION

This is the initial event in a CWC Challenge Inspection. This event is displayed prior to the start of the exercise by the Moderator. A discussion of CWC notification requirements is also conducted with all of the exercise participants prior to starting the **ACE-*IT*** exercise. Notes from the discussion can be entered into the system by the Inspection Team and Inspected Party using the SAVE NOTES feature. The inspection exercise involves a challenge inspection under the CWC, during which a fictitious site (CMC complex) will be inspected for possible non-compliance with the CWC, specifically regarding the alleged 1) development, 2) production, or 3) storage of those chemical agents or chemical munitions that are prohibited by the CWC.

2.2 STEP 2: ARRIVAL AT POINT OF ENTRY/SPECIFY SITE

The simulated arrival of the Inspection Team at the Point of Entry initiates the CWC Challenge Inspection "exercise timeline". When the discussion related to the *Notification of Challenge Inspection* is complete, the Moderator starts the exercise from the **ACE-*IT*** Control Module. Fifteen minutes of "exercise time" have been allotted for this event. A discussion is conducted that includes point-of-entry procedures, the inspection of equipment brought by the Inspection Team, and the specification of the site. The Inspection Team provides the Inspected Party with a satellite photo of the requested perimeter from the "Exercise Manual".

2.3 STEP 3: INSPECTED PARTY MONITORS REQUESTED PERIMETER

The CWC requires that the requested inspection site perimeter meet the following requirements:

- Requested perimeter should be at least 10 meters (m) outside any building/structure,
- Requested perimeter should not cut through existing enclosures, and
- Requested perimeter should be at least 10 m distance outside any existing security enclosures.

A "requested perimeter" identifies the boundary of the site that the inspectors wish to inspect.

Upon completion of Step 2, which is determined either by the expiration of the allotted fifteen minutes, or by the Moderator deciding that training has been completed, the **ACE-*IT*** Control Module moves to the *Inspected Party Monitors Requested Perimeter* step. Fifteen minutes of "exercise time" have been allotted for this event.

During this event, the Inspected Party must decide how to monitor the requested perimeter identified in the previous step. Available monitoring techniques (See Table 2) and CWC monitoring requirements are discussed. To assist users in the decision making process, the **ACE-*IT*** system includes AutoCAD® maps of the requested site. (See Figure 5.) These maps include the requested perimeter, along with the location and approximate field of view of available sensors at the site (See Figure 6.) These maps can be reached by switching to the AutoCAD® window. (Windows are switched by using the keyboard command [ALT-TAB] or by [CTRL-ESC] to access the Windows® Task Manager.) The Inspected Party selects several monitoring options from the list displayed in the left-hand box of the **ACE-*IT*** Control Module window. (See Figure 7.) The Inspected Party highlights, for example, "Traffic Log" and "Camera at exit" by holding the <CTRL> key and clicking the mouse button when the pointer is moved onto each entry. The options are selected by clicking the **SELECT OPTIONS** button. The selected options then appear in the right-hand box in the **ACE-*IT*** Control Module window. Once the options are selected they cannot be changed.

Table 2. Available Monitoring Techniques

Exits	Perimeter
Lock and seal exits	Patrol perimeter
Stationed personnel at exits	Place detection sensors at perimeter
Keep traffic logs	Place cameras around perimeter
Place cameras at exits	Place chemical sampling equipment at portals
Place detection sensors at exits	Keep traffic logs
Inspect vehicles, if permitted	

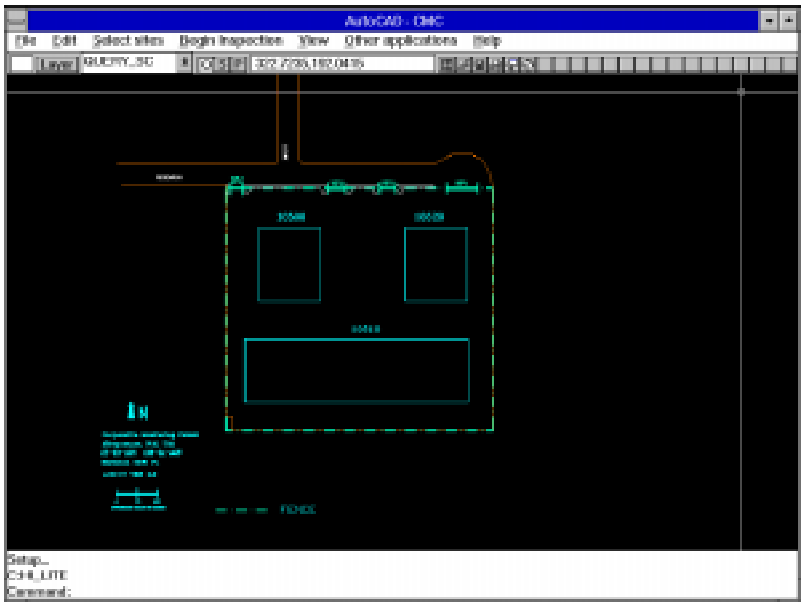


Figure 5. AutoCAD® CMC Complex Map

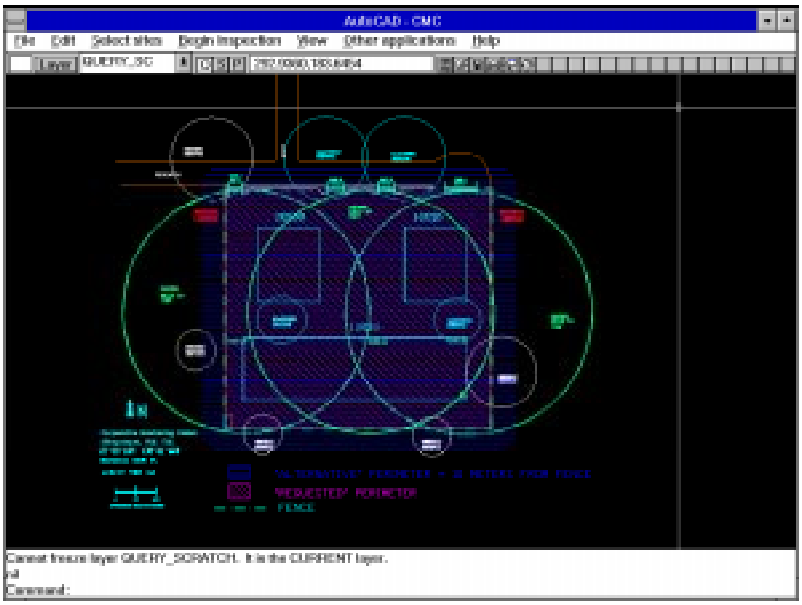


Figure 6. AutoCAD® Map of CMC Complex Sensors

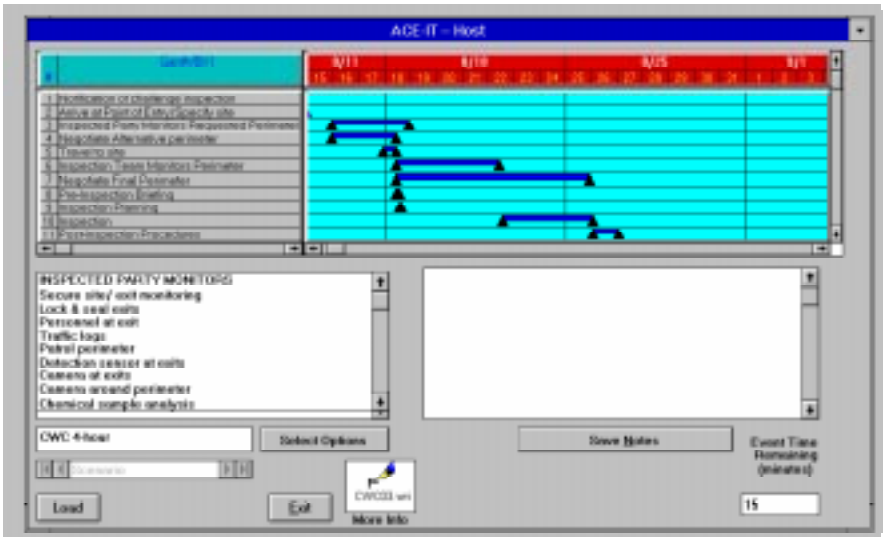


Figure 7. Inspected Party Selects Site Monitoring Options

AutoCAD® Menus

At the top of the AutoCAD® window is a bar that provides access to a group of pull-down menus. These menus allow users to navigate the available views of the CMC Complex. Figure 8 shows the VIEW Menu, which provides the user with a listing of the views available in the system. The user selects a particular view by clicking on the selection.

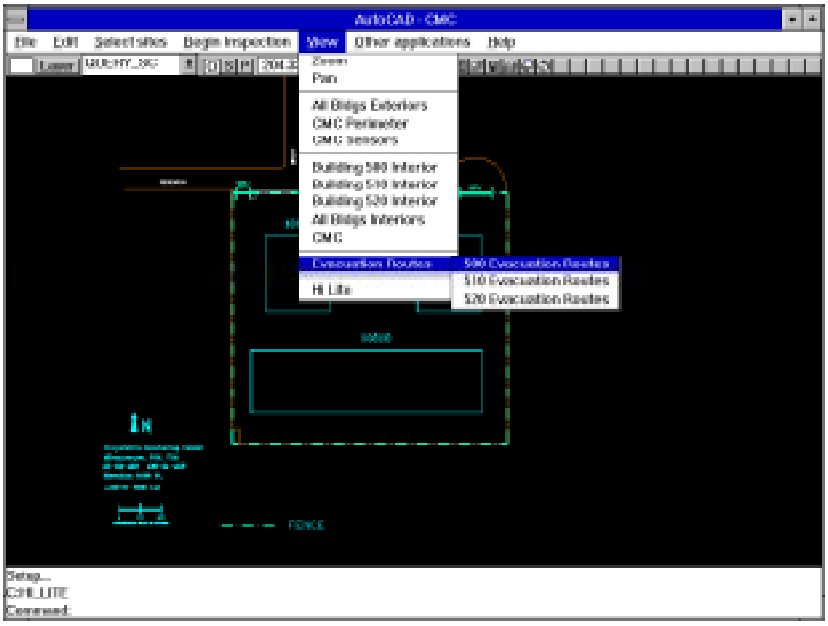


Figure 8. AutoCAD® VIEW Menu Selections

Figure 9 shows the view displayed when the user selects the menu item "CMC Sensors." To return to the original map, select "All Bldgs Exteriors" from the VIEW Menu.

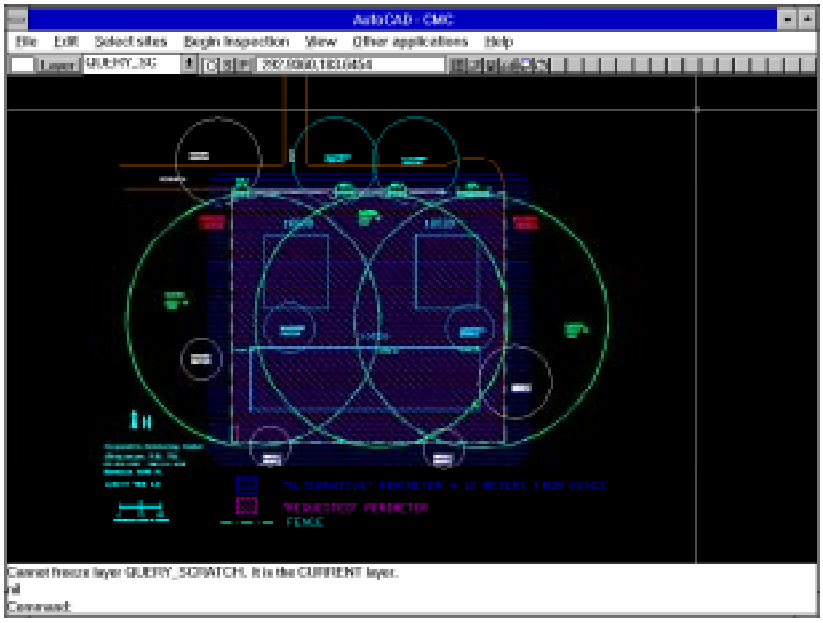


Figure 9. Selection of "CMC Sensors" From VIEW Menu on AutoCAD® Map

2.4 STEP 4: NEGOTIATE ALTERNATIVE PERIMETER

The CWC requires that alternative perimeters offered by the Inspected Party meet the following requirements:

- Should include all of the requested perimeter,
- Should run close to surrounding security enclosures, and
- Establish relationship between requested and alternative perimeters by a combination of two of the following:

    - ⇒ An alternative perimeter does not extend to an area significantly greater than the requested perimeter,
    - ⇒ An alternative perimeter is a short, uniform distance from the requested perimeter, or
    - ⇒ At least part of the requested perimeter is visible from an alternative perimeter.

Upon completion of Step 3, the exercise moves to the *Negotiate Alternative Perimeter* step. Thirty minutes of "exercise time" have been allotted for this event. CWC site perimeter requirements and perimeter negotiation techniques/goals are discussed. The goal of this step is to establish the perimeter for the inspection area. An Alternative Perimeter is negotiated using both the requested perimeter map provided by the Inspection Team and the more accurate site maps provided by the Inspected Party.

Detailed perimeter maps of both the requested perimeter and a satisfactory alternative perimeter are provided in the form of AutoCAD® maps. (Figure 10.)

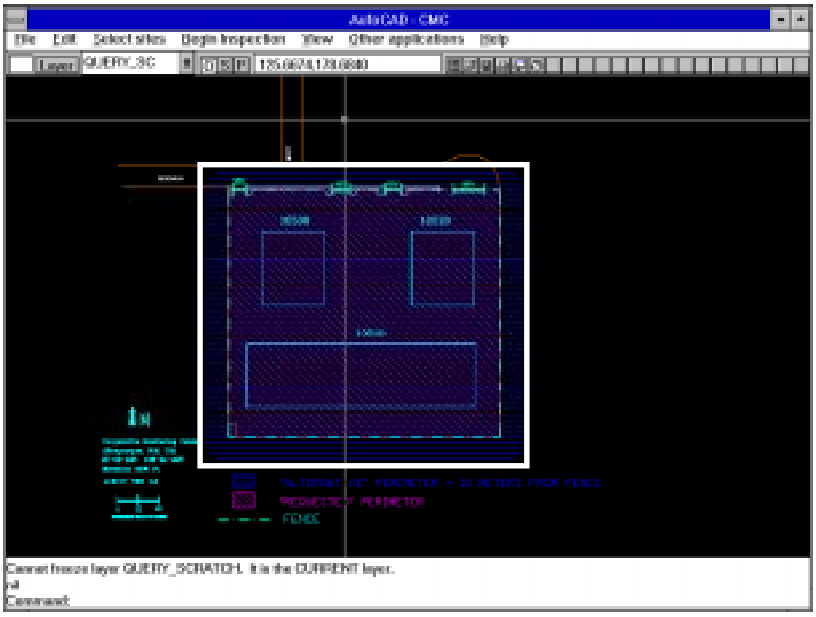


Figure 10. Alternative Perimeter AutoCAD® Map

2.5 STEP 5: TRAVEL TO SITE

Upon completion of the Step 4, the **ACE-*IT*** exercise moves to the *Travel to Site* step. One minute of "exercise time" is allotted for this event. A brief discussion of travel requirements, planning, and limitations is held.

2.6 STEP 6: INSPECTION TEAM MONITORS FINAL PERIMETER

The CWC requires that Inspection Teams perform monitoring within the perimeter in accordance with the following requirements:

- The Inspection Team may conduct perimeter activities in a 50-m band outward from the alternative or final perimeter,
- The Inspection Team may have access to buildings within the 50-m band if the Inspected Party agrees, and
- The Inspection Team must have all directional monitoring equipment oriented inward.

Upon completion of the Step 5, the training exercise moves to the *Inspection Team Monitors Final Perimeter* step. Fifteen minutes of "exercise time" have been allotted for this event. During this event, the Inspection Team must decide on the best way to monitor the perimeter.

This step is virtually identical to Step 3, in that the available techniques are selected using the same key strokes and mouse movements/clicks. However, this selection is made by the Inspection Team, rather than by the Inspected Party. As in Step 3, a discussion of available monitoring techniques (Table 2) and CWC monitoring requirements is held. The Inspection Team selects several monitoring options from the list displayed in the left-hand box of the **ACE-*IT*** Control Module. (See Figure 11.) The selections made

by the Inspection Team have no relationship to those made by the Inspected Party in Step 3. The Inspection Team highlights, for example, "Traffic Log," "Camera at exit," and "Chemical Sampling" by holding the <CTRL> key and clicking the mouse button on each entry. The options are selected by clicking the "Select Options" button. The selected options then appear in the right-hand box on the **ACE-*IT*** Control Module. Once the options are selected they cannot be changed.

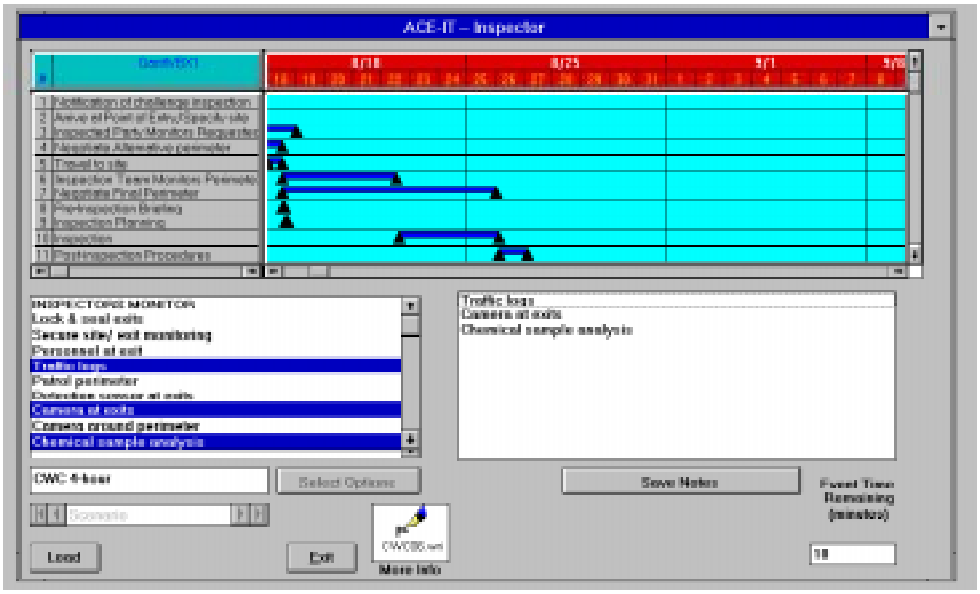


Figure 11. Inspection Team Monitors Final/Alternative Perimeter

2.7 STEP 7: NEGOTIATE FINAL PERIMETER

Upon completion of Step 6, the exercise moves to the *Negotiate Final Perimeter* step. Fifteen minutes of "exercise time" have been allotted for this event. The Moderator determines if additional training (i.e., time) in perimeter negotiation techniques is required (i.e., more than that gained in Step 4) and may move to the next step in the exercise if such training is judged unnecessary.

2.8 STEP 8: PRE-INSPECTION BRIEFING

Upon completion of Step 7, the exercise moves to the *Pre-Inspection Briefing* step. Ten minutes of "exercise time" have been allotted for this event. Pre-inspection requirements, including environmental, safety, and health requirements, are discussed.

2.9 STEP 9: INSPECTION PLANNING

Upon completion of Step 8, the training exercise moves to the *Inspection Planning* step. Ten minutes of "exercise time" have been allotted for this step. During this step, both teams develop an initial plan for completing the inspection. For the Inspection Team, a large part of this plan is the process of developing a list of specific areas that the Inspection Team wants to visit and the overall inspection priorities. The Inspected Party uses this time to identify specific areas of interest that might require special protection or handling.

2.10 STEP 10: INSPECTION

Upon completion of Step 9, the exercise moves to the next event, *Inspection.* A total of 120 minutes of "exercise time" has been allotted for this event. When the **ACE-*IT*** Control Module reaches this event, it automatically loads the AutoCAD® map of the CMC Complex for use in the inspection scenario. Users access this map by double clicking on the **More Info** box in the **ACE-*IT*** Control Module window or switching to the AutoCAD® window. Access to each building is negotiated "verbally" between the players. The "virtual" inspection is conducted by accessing building interior maps. Figure 12 shows the interior of an example building, Building 10510.

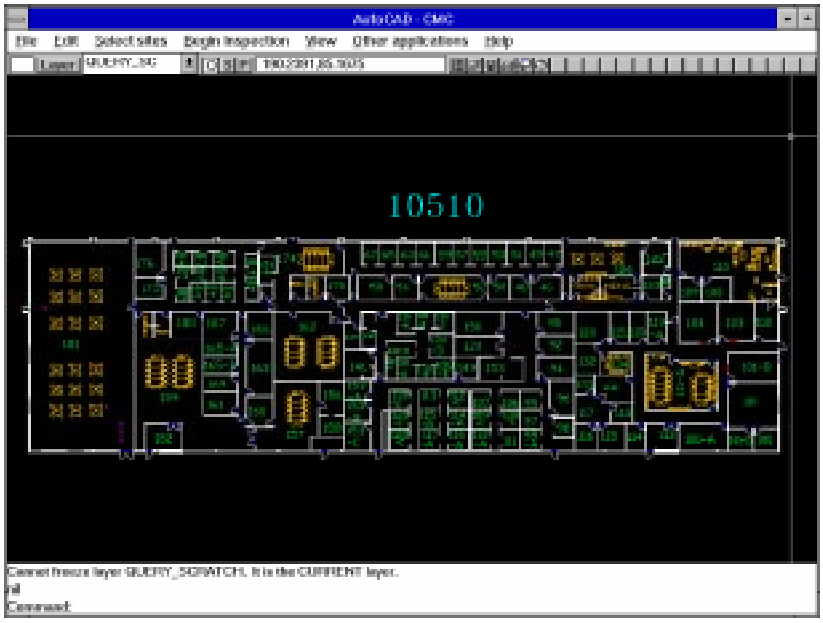


Figure 12. Building 10510 Interior Map

The primary training focus of the *Inspection* event is to expose trainees to the concept of managed access. This module of the **ACE-*IT*** system provides trainees with three types of negotiations: negotiation of physical access, negotiation of visual access, and negotiation of access to alternate information. [One example of controlling visual access is the covering (or "shrouding") of a sensitive item that is not related to the treaty.] Each of these types of negotiation is very different in nature. All negotiations consist of a request from the Inspection Team and an accompanying response from the Inspected Party. At many points a "Hints" button allows the user to reach a screen containing additional information and some useful accessory capabilities (i.e. the chat function). An example of a **HINTS** button can be found in Section 2.10.2.2. The following sections discuss each type of negotiation in detail, in terms of the roles assigned to participants provided by the **ACE-*IT*** system.

2.10.1 Negotiation of Physical Access

This section addresses the operation of the **ACE-*IT*** system beginning with an Inspection Team request for physical access to a facility. It is assumed that all physical access requests are for full access to a specified location.

2.10.1.1 Inspection Team

To initiate the negotiation for physical access, the Inspection Team selects "Begin Negotiated Inspection" from the **BEGIN INSPECTION** pull down menu in the AutoCAD® window, and then clicks on any room on the AutoCAD® drawing. The Inspection Team receives an on-screen notification that the request is being processed (See Figure 13) while this request is passed to the Inspected Party. There are three possible responses to the request: "Access Denied," "Partial Access," or "Full Access".

Figure 13. Initiation of a Request for Access

"Access Denied" gives the Inspection Team a color-coded response (red) stating that access will not be granted. When this response is received, the Inspection Team can negotiate for further access into the room, request Alternate Information, or continue on to a different room (See Figure 14), all of which can be initiated from the notification window. Click the **REPEAT REQUEST** button to enter a justification for entering the room. Click the **CONTINUE** button to return to the AutoCAD® map, where another room can be selected. Requests for Alternate Information are initiated from the **HINTS** button on the response window. For more information on requesting alternate information see Section 2.10.3.

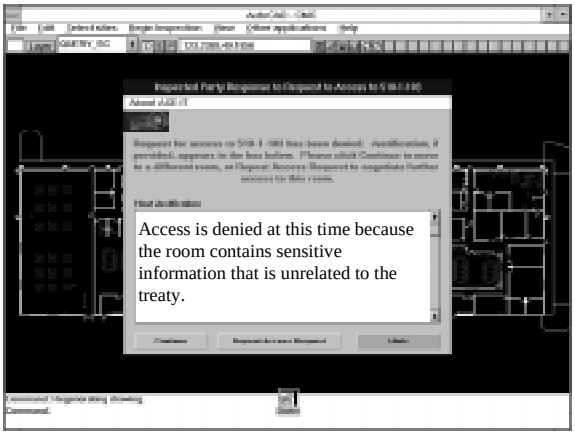


Figure 14. Receipt of Access Denied Notification

"Partial Access" gives the Inspection Team a color-coded message (yellow), as well as access to a limited photo tour of the room, which consists of views from the door, the window, or both. (See Figure 15.) From the response window, the Inspection Team can repeat the access request, request alternate information, or access the photo tour. Click the **REPEAT REQUEST** button to enter a justification for entering the room. (See Figure 16.) Click the **CONTINUE** button to view the photo tour of the room (see Figure 17). From the photo tour windows, the photos can be zoomed, and requests for shroud lifts and alternate information are made. Click the **ZOOM** button to enlarge the photos. Lifting shrouds and requesting alternate information are negotiated separately. For more information on lifting shrouds and requests for alternate information see Sections 2.10.2 and 2.10.3, respectively.

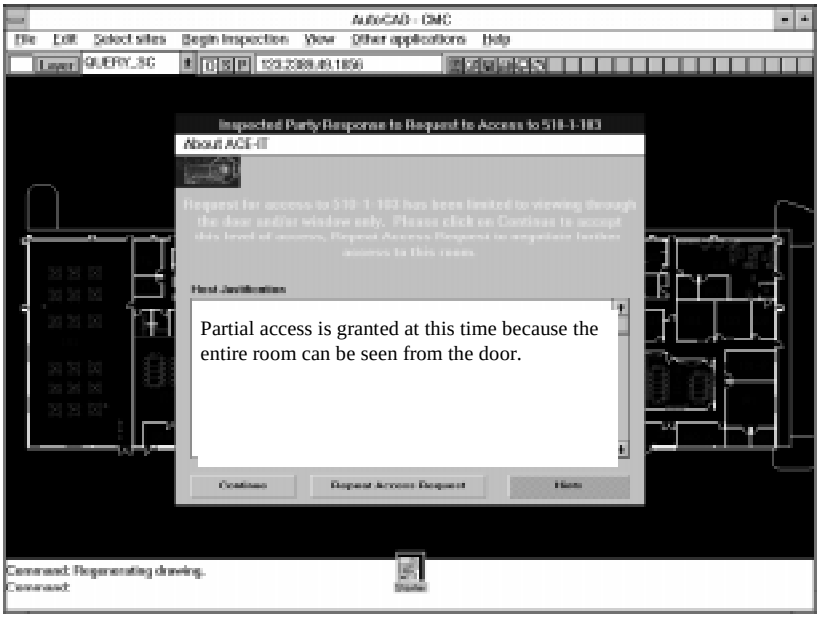


Figure 15. Receipt of Partial Access Granted Notification

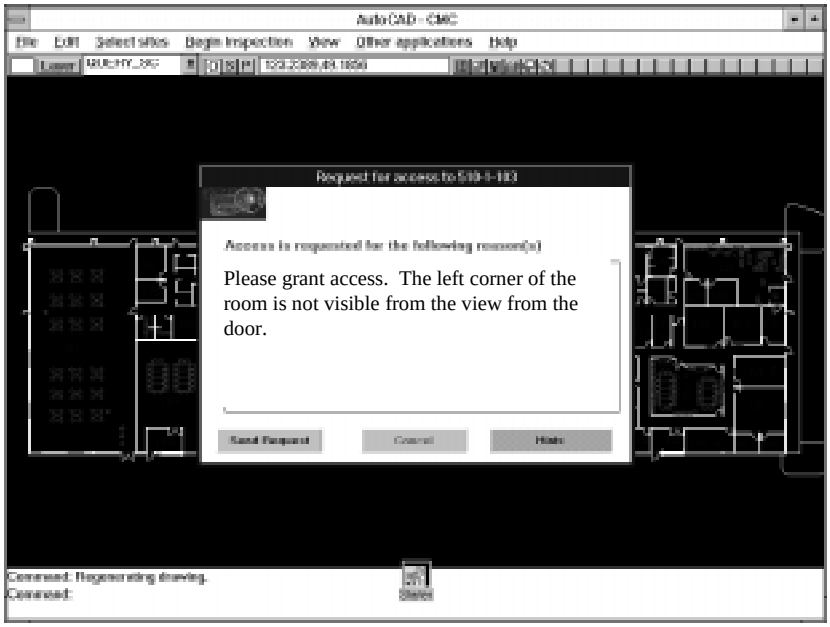


Figure 16. Repeat Request for Access with Justification

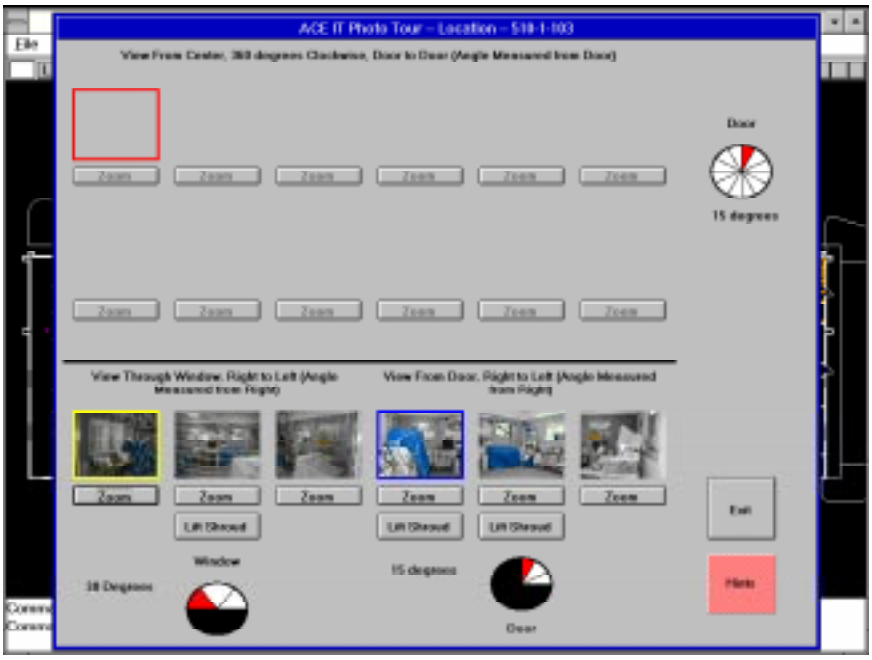


Figure 17. Inspection Team Views Partial Access Photo Tour

"Full Access" gives the Inspection Team a color-coded message (green), as well as access to a photo tour of the entire room. From the response window, the Inspection Team can either request alternate information or access the photo tour. Click the **CONTINUE** button to access the photo tour of the entire room, which consists of a view from the door, a view from the window, and a 360° view from the center of the room. (See Figures 18 and 19.) From the photo tour window, the photos can be enlarged and shroud lifts and alternate information can be requested. Click the **ZOOM** button to enlarge the photos. To assist the user in determining the approximate scale of the objects in the zoom window, an on-screen meter stick has been provided. Double click on the yellow measuring stick to activate this feature. The meter stick can then be dragged to any location on the screen. Clicking the right mouse button switches the meter stick from the vertical orientation to the horizontal, and back again. Double click on the yellow part of the stick to remove the meter stick from the screen. Figure 20 shows the meter stick on a zoomed window. Lifting shrouds and requesting alternate information must be negotiated separately. For more information on these actions, see Sections 2.10.2 and 2.10.3, respectively.

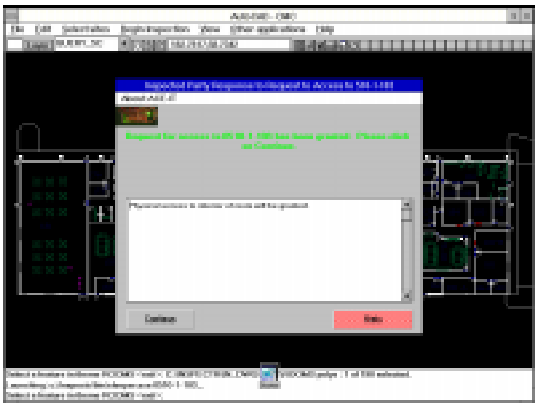


Figure 18. Receipt of Full Access Granted Notification

Figure 19. Inspection Team Views Full Access Photo Tour

Figure 20. Zoom Window with On-Screen Meter Stick

2.10.1.2 Inspected Party

The Inspected Party receives a request from the Inspection Team for full access to a selected room. The Inspected Party has several response options: Deny Access, Offer Partial Access, or Grant Full Access. (See Figure 21.) "Full Access" provides the Inspection Team with a photo tour of the entire room, consisting of views from the door, the window, and a 360° view from the center of the room. "Partial Access" provides the Inspection Team with a photo tour of the room, consisting of views from the door or the window or both. The Inspected Party decides whether to limit the access to one or both of the available views. "Access Denied" does not provide the Inspection Team with any view of the room.

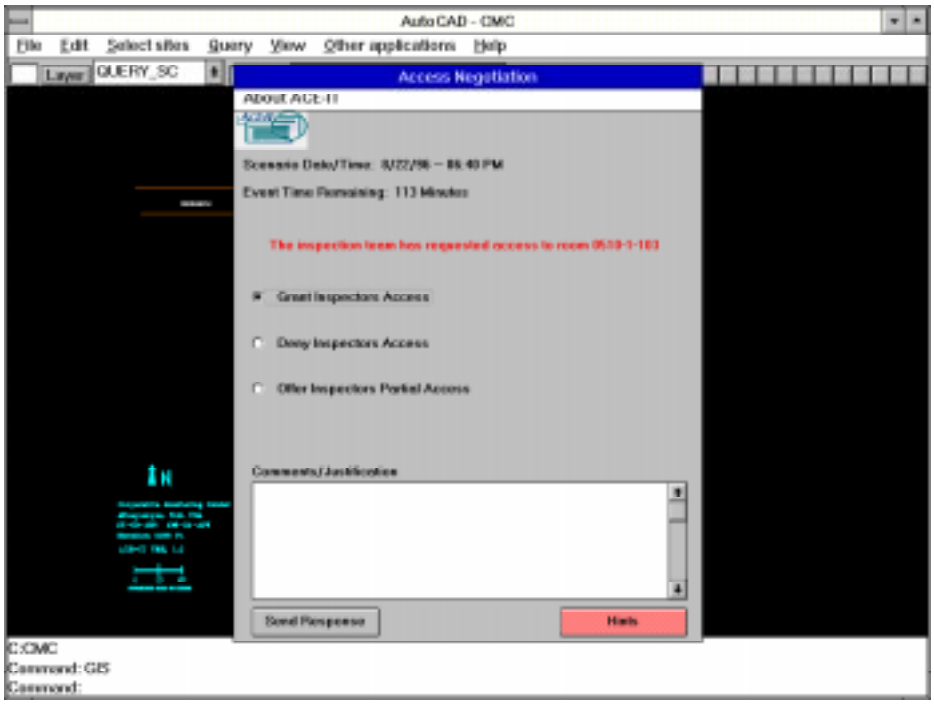


Figure 21. Receipt of Access Request

There are several options that help the Inspected Party decide what level of access to grant to the Inspection Team. (***NOTE:*** *To enhance the effectiveness of the training session, the Inspected Party does not have to be familiar with the facility layout. The computer displays the information associated with the requested room.*) Click the **HINTS** button in the lower right-hand corner of the Access Negotiation box and then click the **PREVIEW ROOM** button in the resulting HINTS Box to view the photo tour of the entire room. (See Figures 22 and 23.) From the photo tour, the photos can be zoomed, shrouds can be lifted, and alternate information can be previewed. Click the **ZOOM** button to enlarge the photos. The on-screen meter stick is the same as that provided for the Inspection Team. If the location selected has no photographs associated with it (such as conference rooms, rest rooms, and other non-sensitive areas), the user is provided with a message box stating that there is no photographic data for the requested location.

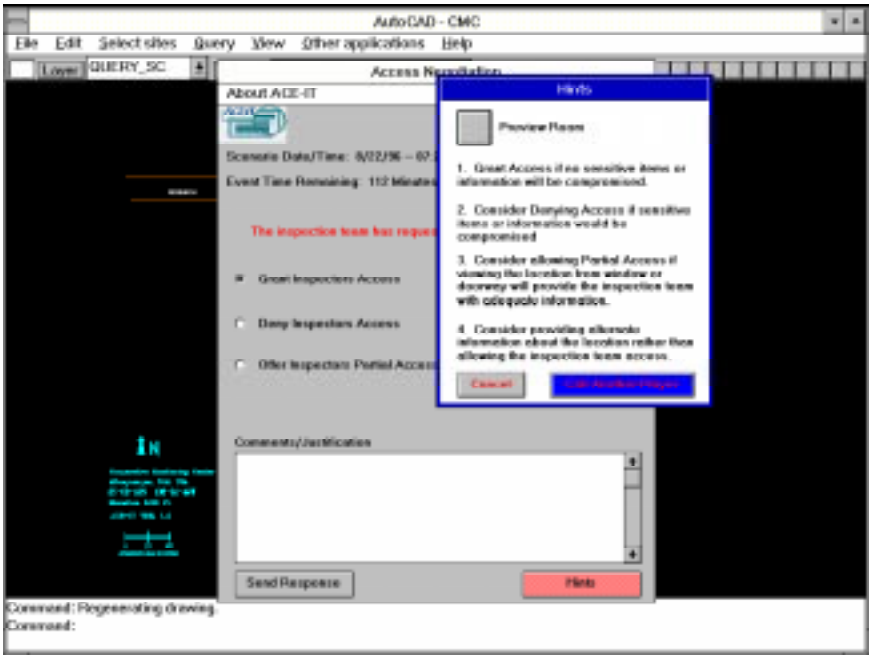


Figure 22. Inspected Party Accessing the Room Preview

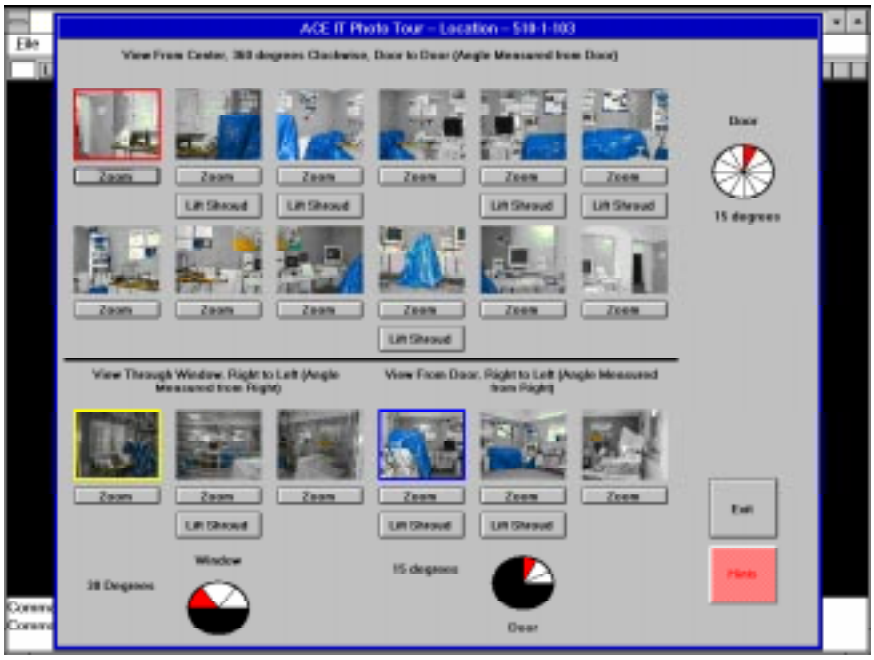


Figure 23. Inspected Party Views Preview of Photo Tour

Click the **LIFT SHROUD** button under the picture of the shrouded item of interest to preview the item beneath the shroud. The Lift Shroud window displays the shrouded item, and provides a brief description and the approximate dimensions of the object. (See Figure 24.) The on-screen meter stick is also provided in this window. The scroll bar running from right to left beneath the image determines how much of the shroud will be lifted. Slide this scroll bar to 50% and click the **PLAY** button. (See Figure 25.) The item will be partially unshrouded. To determine the level of unshrouding that would be acceptable without revealing any sensitive information, slide the scroll bar to different percentages and

click the **PLAY** button. Repeat this action until the desired level of unshrouding is achieved. Click the **CANCEL** button to close the window.

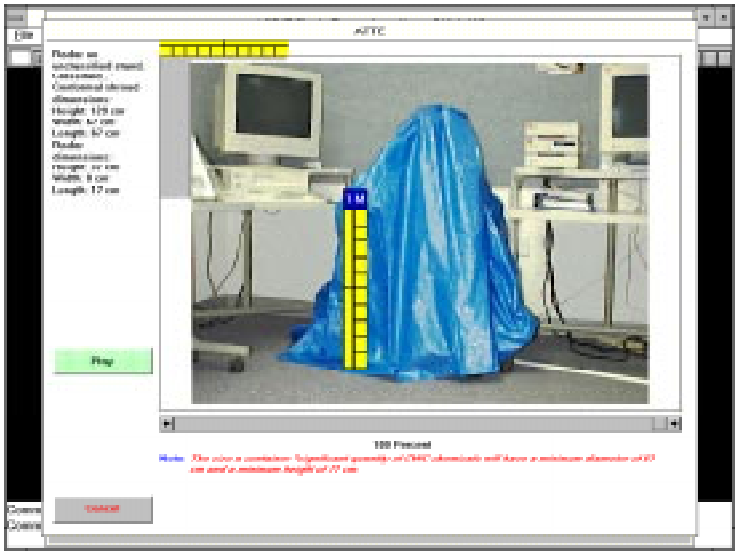


Figure 24. Inspected Party Views Preview of Shroud Lift

Figure 25. Inspected Party Views Partial Shroud Lift

To access Alternate Information, click the **HINTS** button on the photo tour window, and then click the **ALTERNATE INFORMATION** button. "Alternate Information" consists of five topics, each of which is represented by a button: Chemical Sampling, Proprietary Research Information, Hazardous Waste Information, Inventory of Items, and Other Information. (See Figure 26.) Click the appropriate button to preview the desired alternate information. For example, click the **HAZARDOUS WASTE INFORMATION** button to display the Hazardous Waste Information associated with the requested room. (See Figure 27.) The other buttons work similarly, with the exception of Chemical Sampling. Chemical Sampling is an interactive window, and is meant to be used to record the *taking* of a sample, not to display past sampling results. For details on negotiating access to alternate information, see

Section 2.10.3. If the selected topic has no data for the requested location, the screen displays a message box stating that no information is available.

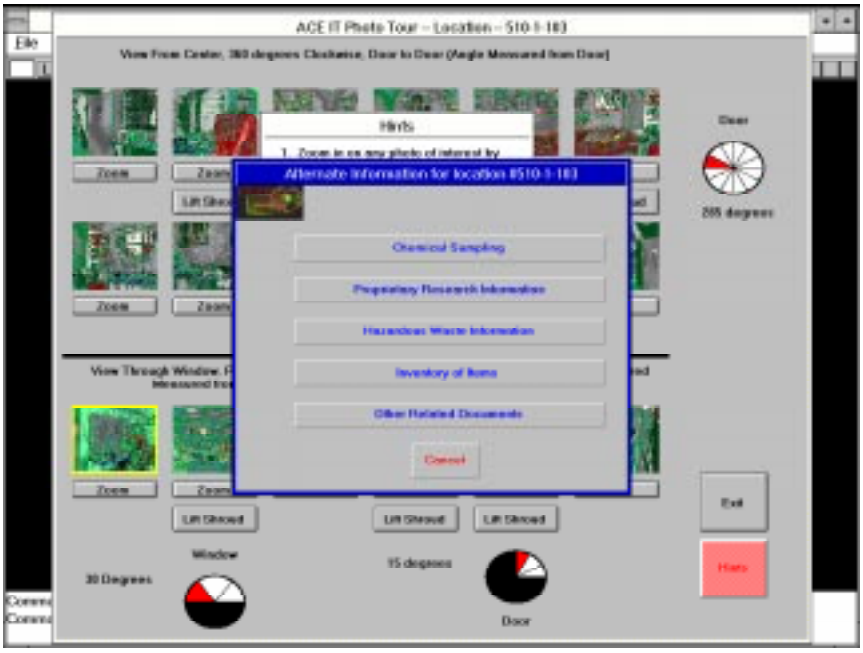


Figure 26. Inspected Party Alternate Information Preview

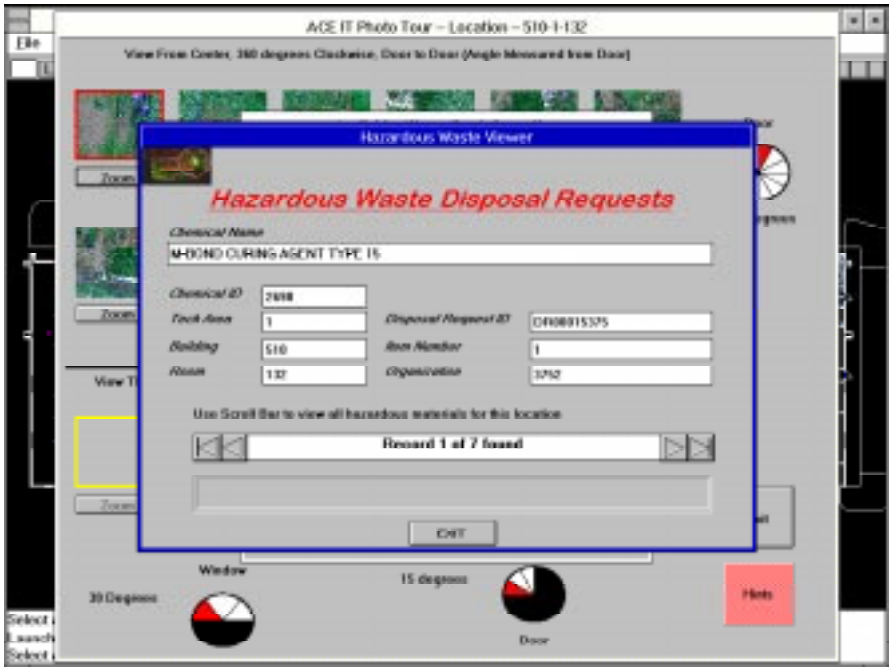


Figure 27. Inspected Party Hazardous Waste Information Preview

2.10.2 Viewing Shrouded Items

The viewing of shrouded items is negotiated once a level of physical access has been granted that provides the Inspection Team with a view of a shrouded item. Requests to view shrouded items are accepted and negotiated on an individual basis.

2.10.2.1 Inspection Team

To initiate a negotiation to view a shrouded item, click the **Lift Shroud** button located beneath the photo that contains the item of interest in the photo tour window. (See Figure 28.) If there are multiple shrouds in a photo, the next window will contain photos of each of the shrouded items in the original photo. (See Figure 29.) If only one item is visible, only that item is displayed. From the shroud lift window, a justification for the request can be entered. (See Figure 30.) To send a request to the Inspected Party to view a shrouded item, click the **Send** button.

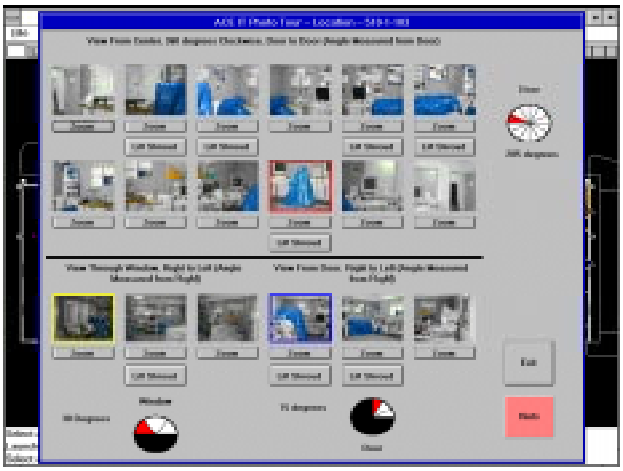


Figure 28. Inspection Team Views Full Access Photo Tour

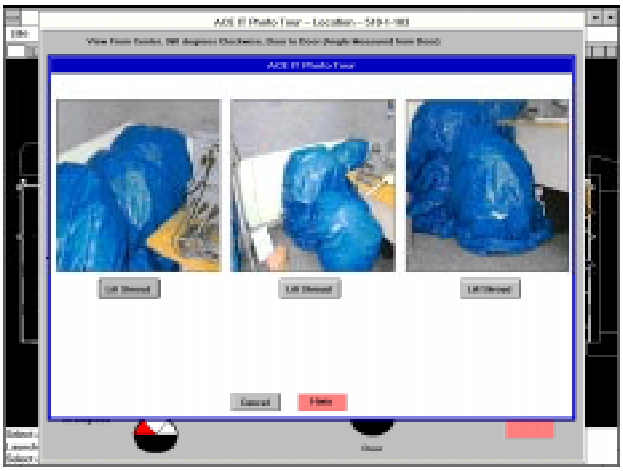


Figure 29. Inspection Team Views Multiple Shroud Window

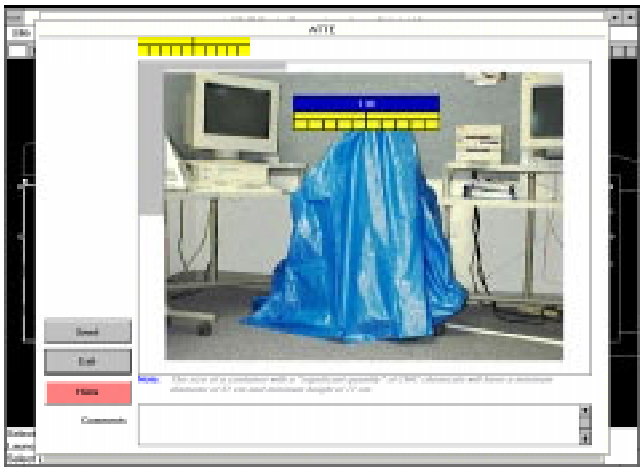


Figure 30. Inspection Team Views Single Shrouded Item

The response to the request can either be "Full Unshroud," "Partial Unshroud," or "Request Denied." If the response from the Inspected Party is "Full Unshroud," the Inspection Team's computer will chime and the unshrouding will begin a few seconds after the chime. The item will be automatically and completely unshrouded, and the description and dimensions of the object will be displayed. (See Figure 31.) If the response is "Partial Unshrouding" the Inspection Team's computer will chime and the unshrouding will begin a few seconds after the chime. The item will be automatically unshrouded between 0% and 100%, depending on the selection the Inspected Party has made. (See Figure 32.) No description/dimensions are displayed unless the shroud is lifted 100%. If the request is denied, the computer will chime and a notification that the request was denied will be displayed. Any comments from the Inspected Party will appear after the message box is cleared. (See Figure 33.)

Figure 31. Inspection Team Views Complete Unshroud

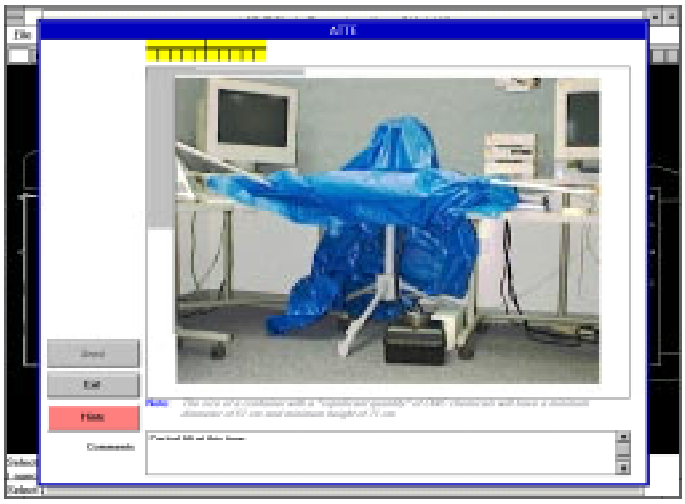


Figure 32. Inspection Team Views Partial Unshroud

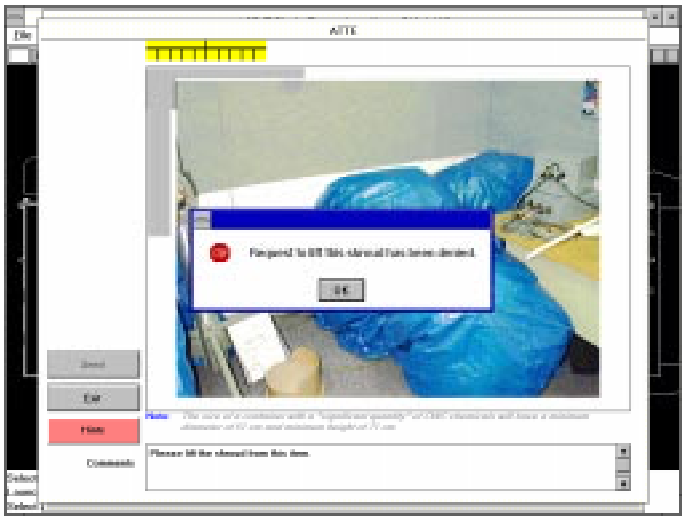


Figure 33. Inspection Team is Denied Permission to Lift Shroud

2.10.2.2 Inspected Party

The Inspected Party receives a request to lift a shroud. (See Figure 34.) The Lift Shroud window is displayed with the scroll bar set at 100%, and the description and dimensions of the object are displayed. Slide the scroll bar and click **Play** to preview any percentage of the shroud lift. (See Figure 35.) If partial or complete unshrouding will reveal a sensitive object, click the **Request Denied** button. To send a more detailed response to the Inspection Team, enter any desired comments in the box labeled "Comments". If a partial or complete unshrouding of the item is granted, slide the scroll bar to the desired percentage of shroud lift, and click the **SEND** button.

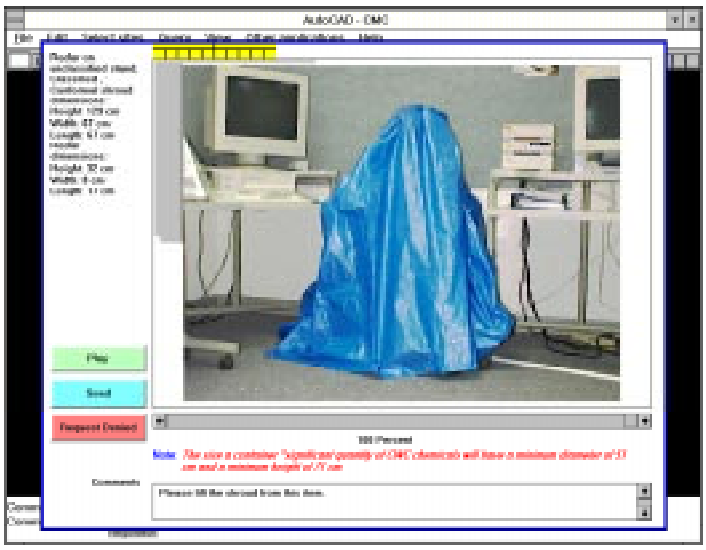


Figure 34. Inspected Party Receives Request to Lift Shroud

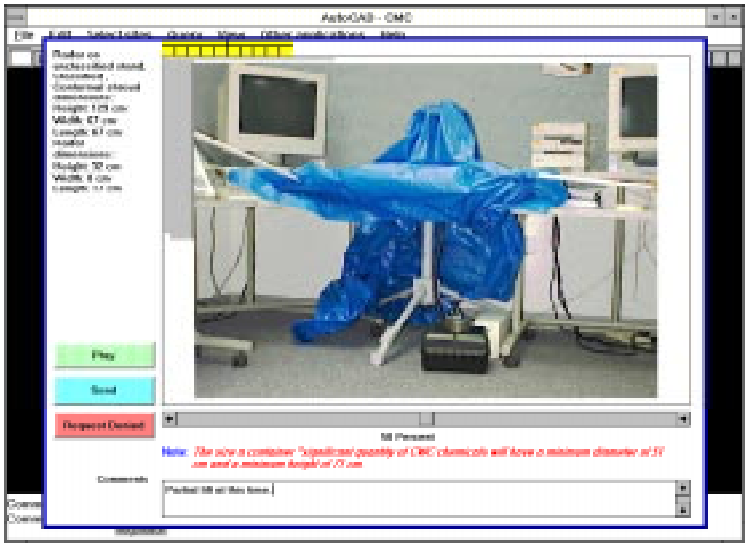


Figure 35. Inspected Party Previews Partial Lift of Shroud

2.10.3 Alternate Information Negotiation

Access to alternate information can only be requested once a request for physical access to a specific location has been made. Alternate information can be requested regardless of the response to a request for physical access. Requests for Alternate Information can only be processed for specific locations. A site- or building-wide request for such data is not possible within the framework of the **ACE-*IT*** system.

2.10.3.1 Inspection Team

Alternate information can be requested from most of the **HINTS** windows in the system. To request alternate information click the **Hints** button, then click the **Alternate Information** button. (See Figure 36.) Alternate information consists of five topics: Chemical Sampling, Proprietary Research

Information, Hazardous Waste Information, Inventory of Items, and Other Information. (See Figure 37.) Click the **REQUEST All Alternate DATA** button to request all five areas, or click any combination of buttons to request selected areas. Then click **REQUEST**. The system will ask if the user would like to add specific comments to this request. If the answer is yes, a text box will appear in the bottom of the Alternate Data window. Comments are placed into this box, and the **REQUEST** button is clicked again to send the request to the Inspected Party. (See Figure 38.)

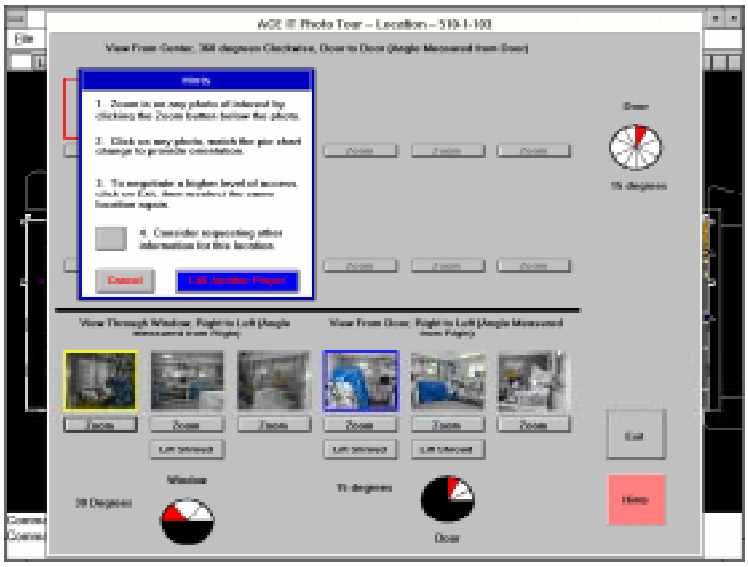


Figure 36. Inspection Team Requesting Alternate Information

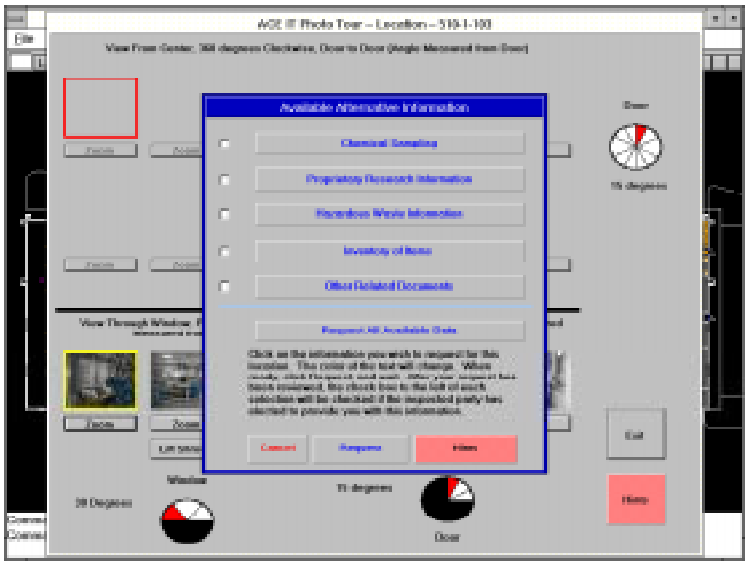


Figure 37. Inspection Team Requesting All Available Alternate Information

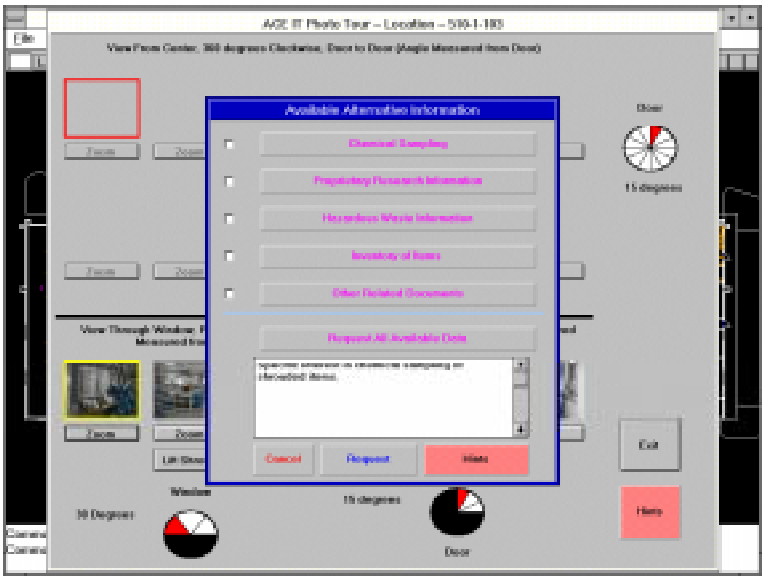


Figure 38. Inspection Team Adding Detail to Request for Alternate Information

A response is sent to the Inspection Team once the Inspected Party determines which types of alternate information will be provided. The topics of alternate information that the Inspected Party has agreed to provide are indicated by checks in the boxes on the left side of the window corresponding to each topic. (See Figure 39.) Click the button next to the granted topic to view the available alternate information. (See Figure 40.) If no data on the requested topic is available, the user is notified with a message box stating which data are unavailable.

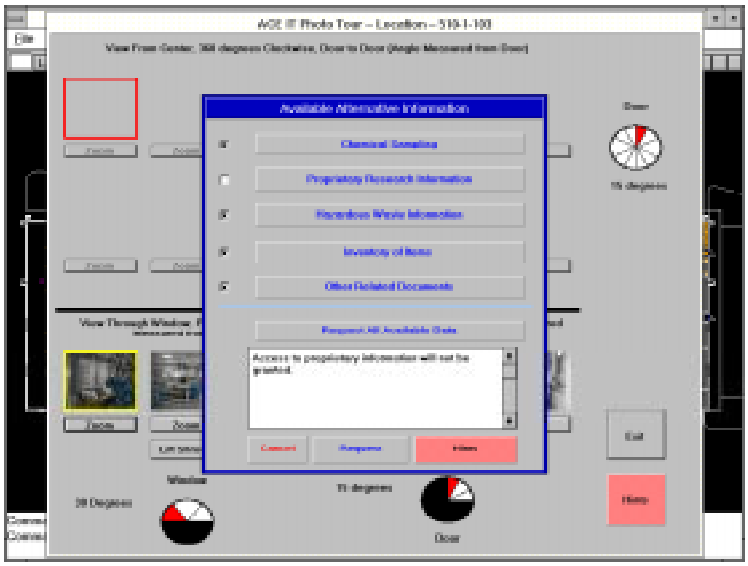


Figure 39. Granted Alternate Information

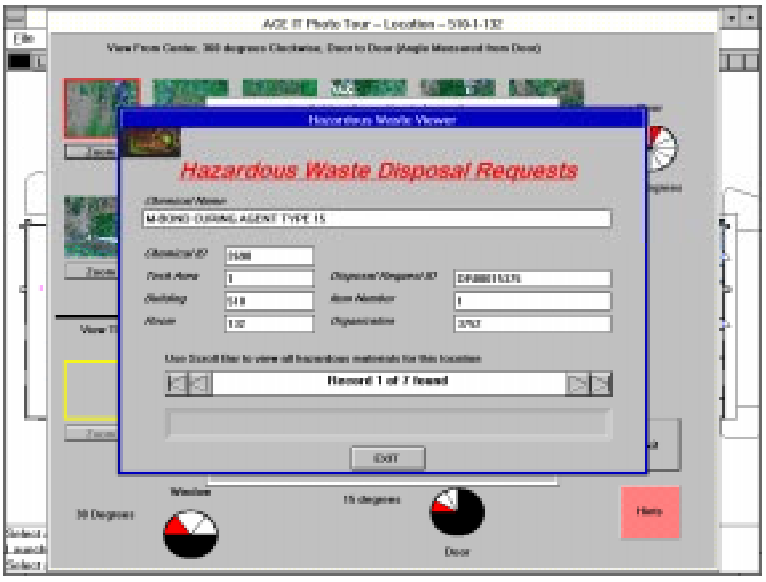


Figure 40. Viewing Alternate Information (Hazardous Waste Information)

If chemical sampling is requested, and if permission to perform chemical sampling is granted, then the Inspection Team can take a sample by clicking on the button labeled **CHEMICAL SAMPLING.** To provide a greater sense of realism, chemical sample results are not returned immediately. The user is notified of the amount of time required for sample processing, and decides whether or not continue with the sampling process. (See Figure 41.) If the user elects to take a sample, the window shown in Figure 42 appears. The Inspection Team then assigns a SAMPLE ID (identification), selects a SAMPLE TYPE, and adds any necessary detail in the box labeled LOCATION AND DESCRIPTION OF SAMPLE. When the user clicks **OK**, this window disappears.

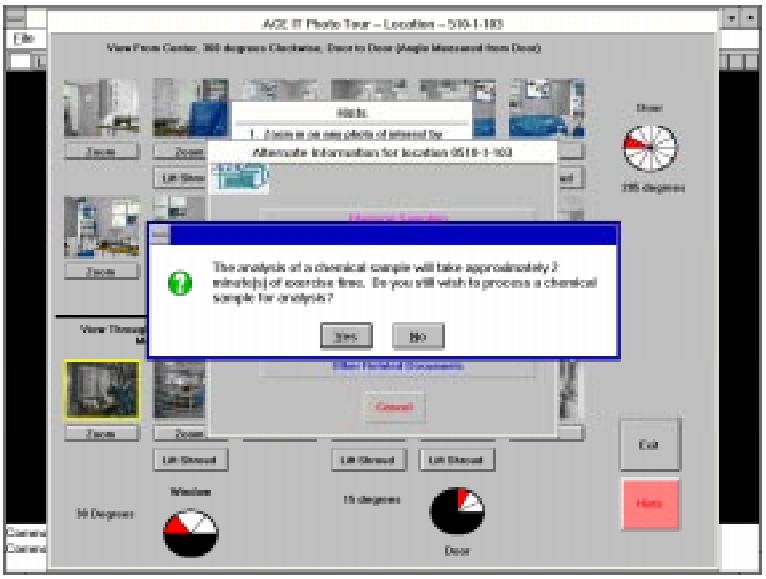


Figure 41. Inspection Team Receives Sample Analysis Time Delay Notification

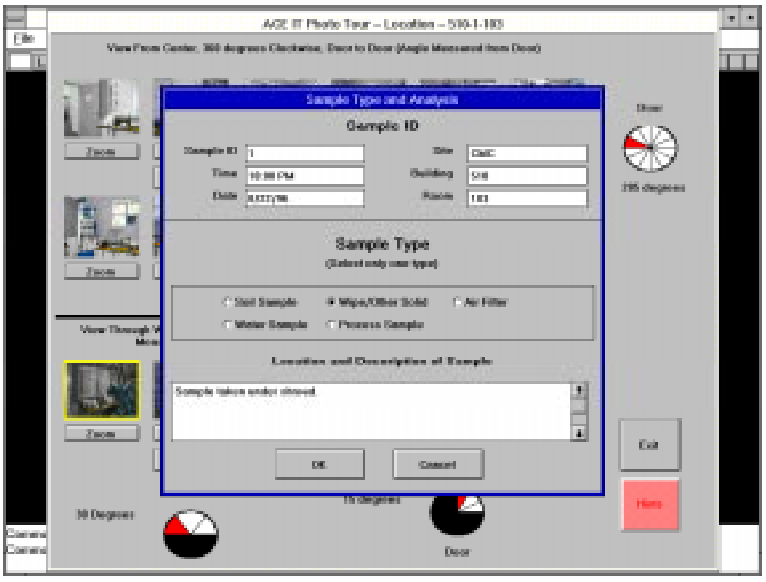


Figure 42. Inspection Team Records Sample Type and Analysis

When the amount of time required for sample processing has elapsed, the window shown in Figure 43 will appear on the screen, regardless of any other actions currently being carried out.

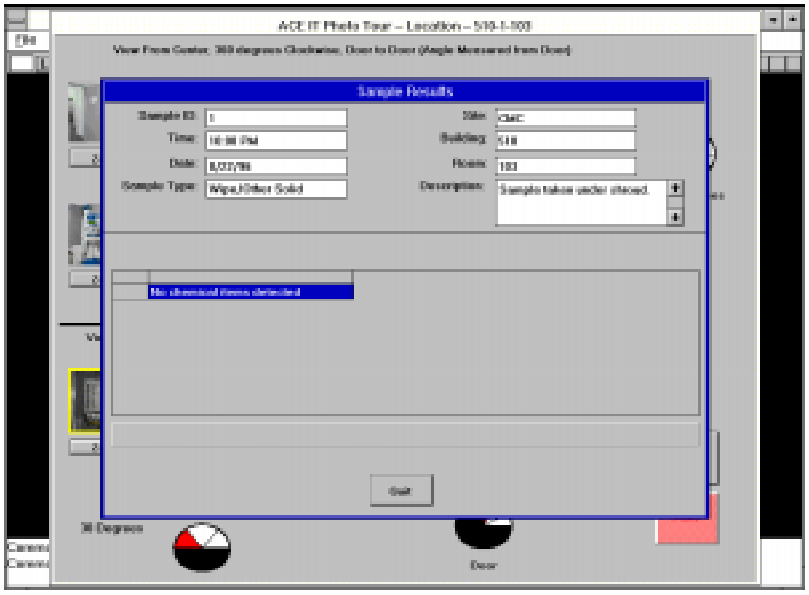


Figure 43. Inspection Team Receives Sample Results

2.10.3.2 Inspected Party

The Inspected Party receives a request for alternate information from the Inspection Team. The requested topics are indicated by checks in the corresponding boxes on the left side of the window. (See Figure 44.) As before, the alternate information consists of five topics: Chemical Sampling, Proprietary Research Information, Hazardous Waste Information, Inventory of Items, and Other Information. Click any of the buttons to preview the alternate information. The Inspected Party responds to the Inspection

Team by checking the boxes on the left side of the alternate information buttons. Any of the boxes may be checked if the Inspected Party wishes to provide the information to the Inspection Team.

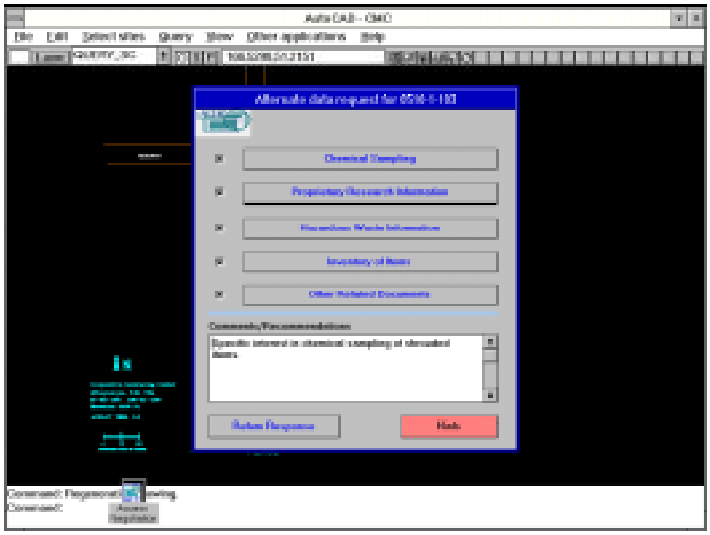


Figure 44. Receipt of Alternate Information Request

Chemical sampling can be initiated by clicking on the **CHEMICAL SAMPLING** button**.** Once initiated, the Inspected Party can assign their own sample identification, sample type, and any desired details to the sample. They can then decide, based on the results of the sample, whether or not to allow the Inspection Team to take or request samples.

Proprietary research information can be previewed by clicking on the **PROPRIETARY RESEARCH INFORMATION** button. Since one of the core concepts of managed access is the protection of potentially sensitive information or items not related to the treaty, the Inspected Party must carefully consider the consequences of revealing information of this nature. If no information exists for the requested location, the user is notified with the appropriate message box.

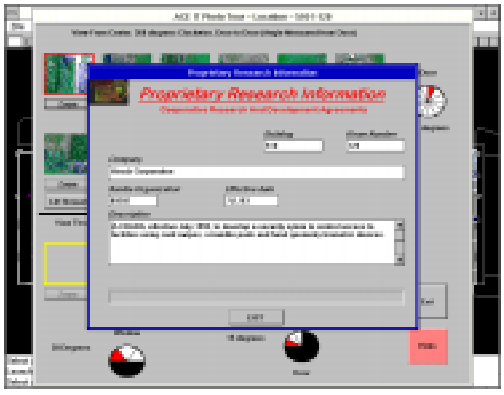


Figure 45. Inspected Party Views Proprietary Research Information

To close this window, click on the **EXIT** button.

Hazardous Waste Information can be requested by clicking on the **HAZARDOUS WASTE INFORMATION** button. If no information exists for the requested location, the user is notified with the appropriate message box. Figure 46 shows the window displaying this information. To close this window, click on the **EXIT** button.

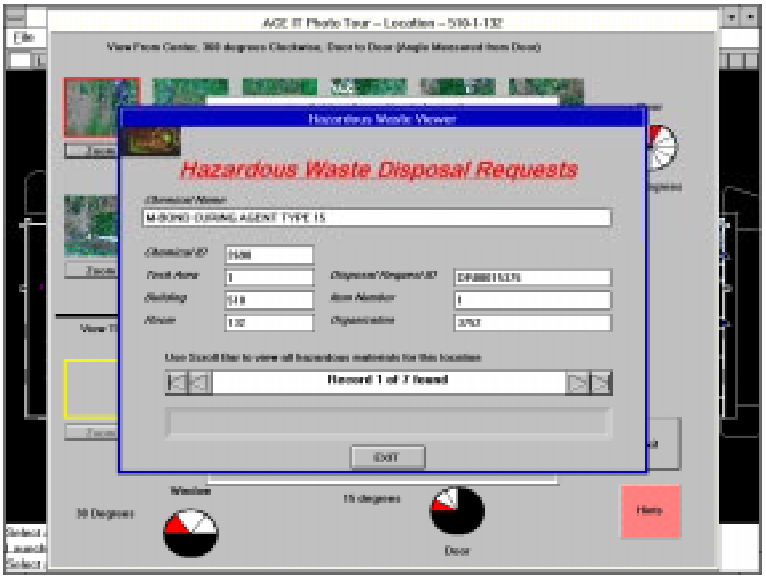


Figure 46. Inspected Party Views Hazardous Waste Information

The inventory of items can be requested by clicking on the **INVENTORY OF ITEMS** button. If there is no inventory for the requested location, the user will be notified with the appropriate message box. Figure 47 shows the window displaying the inventory data.

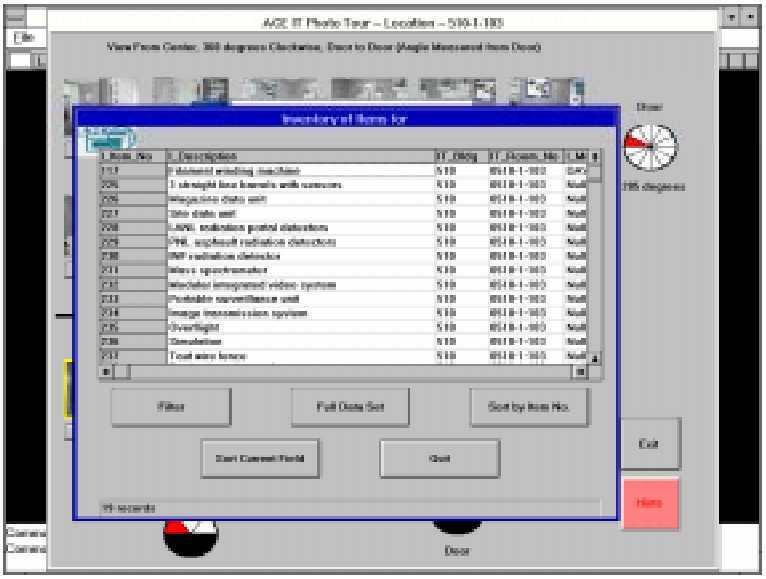


Figure 47. Inspected Party Views Inventory of Items

The inventory window also allows the user to sort the displayed data by any desired parameter. Move the cursor over the desired information field and click on any record. Click the **SORT CURRENT**

FIELD button and the records will be sorted in ascending ASCII order within the selected field. In addition, the user can further "filter" the data to identify a particular item of interest. The user first clicks on the desired field, then on the **FILTER** button. Figure 48 shows the window for filtering the I_Description field for the key word "magazine."

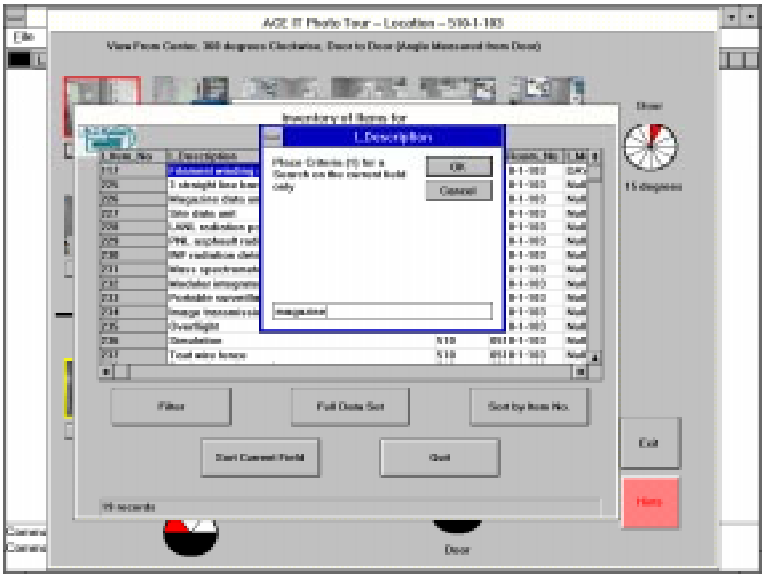


Figure 48. Filtering the Inventory of Items

Figure 49 shows the result of this filtering operation.

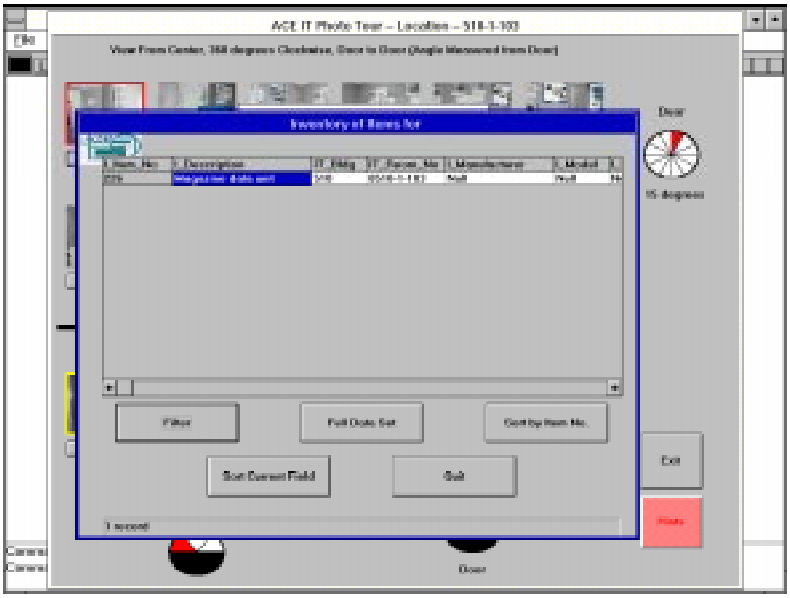


Figure 49. Results of Filter for Keyword "magazine"

To return to the original data set, click on the **FULL DATA SET** button. The sort and filter functions have no effect on the data that is provided to the Inspection Team. If access is granted to inventory, the Inspection Team receives all of the data in the full data set. To close the window, click on the **QUIT** button.

Other relevant documents, such as health and safety directives, and treaty text, have been stored in the form of graphic fax files. They can be accessed by clicking the OTHER DOCUMENTS button. The window presented in Figure 50, below, will appear.

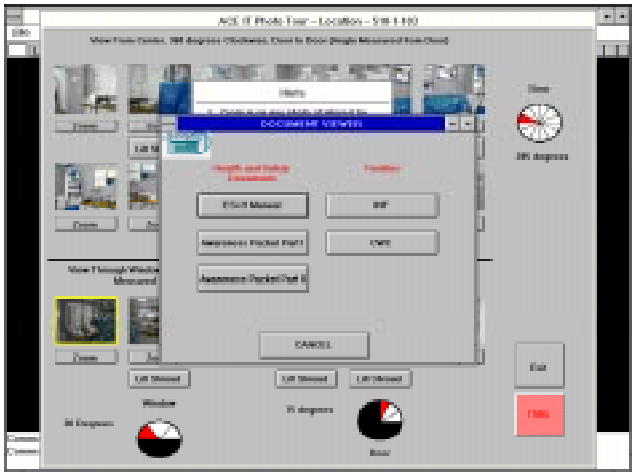


Figure 50. Other Documents Window

By clicking on any of the buttons, the user can view these documents using the Windows® Fax Viewer application. (See Figure 51.) The Fax Viewer allows the user to print and zoom the documents as desired. For more information on the use of the Fax Viewer, use the help function available within the Fax Viewer application itself. To close the Document Viewer window, select EXIT from the Fax Viewer menu.

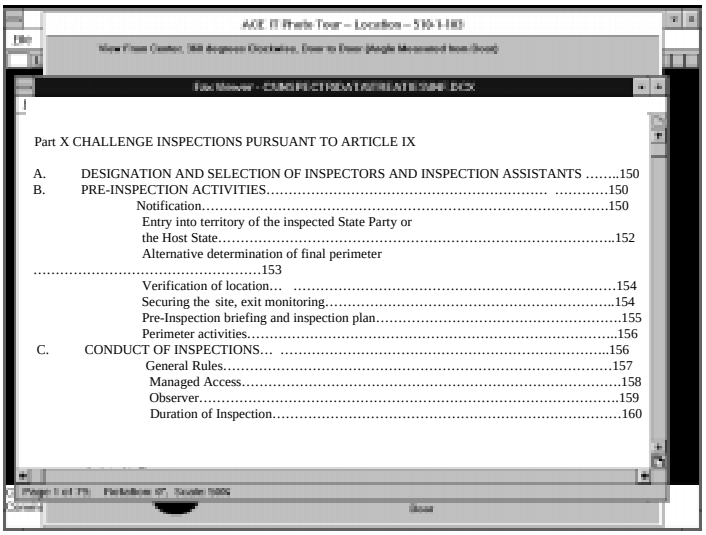


Figure 51. Fax Viewer Window

2.10.4 Recall Function

During the exercise, it may become necessary for the Inspected Party to review photographs or data for the current location to accurately respond to questions from the Inspection Team. (For example: when the Inspection Team is viewing photographs of a room and asks "What is the yellow can in the left corner?", the Inspected Party can then use the RECALL function to view those photographs again.) This is accomplished using the RECALL function. The user switches to the Program manager, and double clicks on the icon labeled RECALL in the **ACE-*IT*** Program window. (See Figure 1.) The RECALL function will load the photo tour for the last requested location. The Inspected Party can then review all of the available information for the location currently being viewed by the Inspection Team. When the user closes the photo tour window, the system returns to normal operation. The RECALL function will not operate until at least one request has been processed by the system.

2.11 STEP 11: POST INSPECTION PROCEDURES

Upon completion of Step 10, the **ACE-*IT*** training exercise moves to the Post Inspection Procedures step, and returns the user to the **ACE-*IT*** Control Module window. Post-Inspection Procedures, such as data evaluation and reporting requirements, are discussed.

When "exercise time" expires, each computer displays a message box stating that "Exercise Time has Expired." When the Moderator clears this message box, the exercise log will automatically print. It is recommended that the Moderator close the AutoCAD® window, and check that the default system printer is on and available to the network, before clearing the "Exercise Time has Expired" message box.

2.12 INSPECTION LOG

The **ACE-*IT*** system provides the instructors/trainees with a detailed, step-by-step log of the events that occurred during the course of the training session. This log is used both as a record of the exercise and to evaluate the effectiveness of the **ACE-*IT*** system in training the participants.

2.13 CHAT Feature

Located in all of the HINTS windows of the **ACE-*IT*** System are buttons labeled CALL ANOTHER PLAYER. These buttons are used to activate the internal CHAT feature. The CHAT feature enables users to use the computer system to communicate with each other. The **ACE-*IT*** CHAT feature records each conversation as it occurs, and marks each with its time of occurrence within the exercise progression. (Note: CHAT can be used to "converse" with the other party when the computers are located in different rooms.)

When a user clicks the CALL ANOTHER PLAYER button, the opposing party will see a small telephone icon appear along the bottom of their screen, and their computer will begin to "ring" audibly. The user receiving the call activates the CHAT feature by double clicking on the phone icon. A window similar to that shown in Figure 52 will appear. Comments or questions are typed into the top box, and the SEND button is clicked to pass that text to the other player's computer. The text will appear in the bottom box as it is sent. When the conversation is completed, the user clicks the icon in the upper left portion of the window (i.e., the one that looks like a hand holding a telephone) to disconnect the CHAT feature. If one party "hangs up" before the other, a phone will appear to the left of the bottom box, indicating that the other party is no longer connected to the CHAT feature. (See Figure 53.)

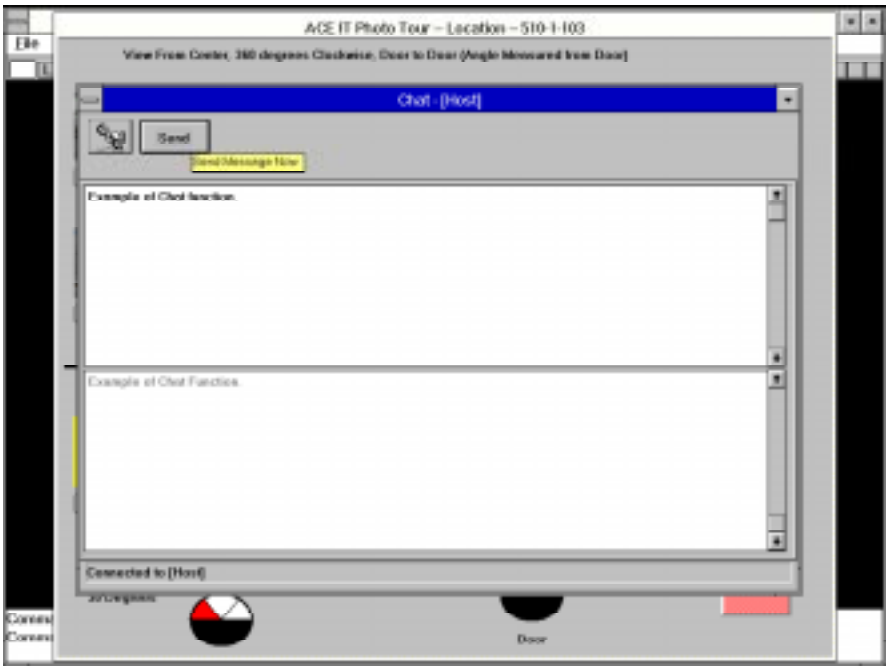


Figure 52. Chat Feature Connected

Figure 53. Chat Feature, Other Party Disconnected

The CHAT feature can be used at anytime during the inspection. However, the CHAT feature should only be used to facilitate communication between the parties. If it is not necessary to record both sides of a conversation, use the SAVE NOTES feature to document relevant information.

3.0 EXERCISE EXAMPLE

This section provides a series of sample inspection events that illustrate the basic system capabilities and provides a general program orientation to users. It does not provide detailed instructions on the use and application of individual modules. For more information on the individual negotiation modules, see Section 2.0.

The **ACE-*IT*** training session begins with the activation of the **ACE-*IT*** Control Module. Each training station (each PC on the **ACE-*IT*** LAN) activates the **ACE-*IT*** Control Module, and selects an exercise scenario as instructed by the exercise Moderator. When all training stations are ready, the Moderator begins the exercise by clicking the **START** button on the Moderator **ACE-*IT*** Control Module window. The scenario begins to run at all training stations, and automatically moves the exercise into Step 2. Each of the training steps are coordinated among the available electronic, hard-copy, presentation, and video training materials. The exercise schedule is controlled by the progression of the exercise and the Moderator. If a step is completed in exactly the time allotted for it by the Control Module, the exercise automatically moves to the next step. In addition, the Moderator has the capability to **PAUSE** the exercise if users fall behind the allotted exercise timeline on any given step, and the capability to **JUMP** to the next exercise step if the current step is completed ahead of schedule. The Moderator is also provided with a display of the total exercise time remaining, and the current scenario date and time. Prior to beginning a new exercise, the moderator must check whether the system is running on the other workstations by clicking the **LOAD** button. If the system is already running, a message box will be displayed notifying the Moderator to stop the current exercise before attempting to load a new exercise.

When the *Inspection* step is reached, all users ensure that the proper maps of the inspected site (the CMC Complex) are displayed on their monitors. The *Inspection* step is conducted primarily at the computer training stations. The general contents of any verbal conversations should be included in the exercise log by either using the SAVE NOTES or CHAT features.

The *Inspection* step begins when the Inspection Team initiates the first request for access to a specific location. All such requests are initiated by the Inspection Team. For example, assume that a request is initiated for full access to room 103. To do this, select **BEGIN NEGOTIATED INSPECTION** from the **BEGIN INSPECTION** menu of the AutoCAD® map of the interior of building 10510 (which should have been the map on-screen at the beginning of this step), place the cursor on room 103, and click the mouse. The Inspection Team's computer monitor displays an indication that the request is being processed. (See Figure 54.)

Figure 54. Inspection Team Initiates Request for Access

4.0 EXERCISE EVALUATION

Upon completion of the **ACE-*IT*** training exercise, the users are evaluated by the exercise Moderator(s). The content and format of the evaluation will vary according to the training context and the needs of the training groups. There is currently no formal objective scoring method for evaluating exercise performance. Evaluations typically focus on both identifying weaknesses in Inspection Team and Inspected Party inspection techniques, and providing information about alternative methods for conducting inspection activities. Exceptional, unique, or innovative approaches to inspections are included as well.

5.0 INITIALIZATION FILES, SYSTEM REINITIATION, AND SYSTEM RECOVERY

The **ACE-*IT*** System uses two initialization files (INI files) that provide the system with crucial information about network drive connections, database files, and installation parameters. Once these files have been properly configured, they should not require user manipulation. Section 5.1 shows an example of the INI files, which can be modified using any ASCII text editor. (For more detailed information see the **ACE-*IT*** Technical Manual.) Section 5.2 provides instructions for the REINITIATION of the **ACE-*IT*** System. This process must be completed prior to each training session. Section 5.3 provides instructions for system recovery resulting from network errors and power surges.

5.1 INITIALIZATION FILES

There are two INI files associated with the **ACE-*IT*** System. They reside in two separate directories. The first file, INSTALL.INI, is found in the C:\INSPECTR\BIN\ subdirectory. The content of this file is:

```
Install Directory = C:\INSPECTR\
```

This INI file tells the system in which directory the **ACE-*IT*** System has been installed.

The second INI file, OSI.INI, is found in the C:\INSPECTR\INI\ subdirectory and contains all of the relevant database and network configuration information. The contents of this file are:

```
ACE-IT Role = Moderator
Inspection Team Drive = I:\
Inspected Party Drive = H:\
Moderator Drive = M:\
Scenario Database = SCENARIO.MDB
Communications database = COMM.MDB
```

These files can be edited using any ASCII text editor. If you are experiencing problems with the **ACE-*IT*** system, it is recommended that you first delete the INSTALL.INI file, and attempt to load the **ACE-*IT*** Control Module before attempting to modify the settings in the OSI.INI file. For more detailed information, see the **ACE-*IT*** Technical Manual.

5.2 SYSTEM REINITIALIZATION

Once the system has been used for the first time, it will be necessary for the user to reinitiate the system database and text files each time **ACE-*IT*** is started. The first step in this process should be to create a copy of the database file, COMM.MDB, which is located in the C:\INSPECTR\DATA subdirectory on the moderator computer. Ensure that all **ACE-*IT*** modules have been closed by checking the Windows® Task Manager window. All tasks related to the **ACE-*IT*** system should be terminated. Then use the file manager to create a copy of the COMM.MDB database file. Move to the moderator computer program manager **ACE-*IT*** window and double click on the icon labeled "Reset **ACE-*IT*** System for New Scenario." The **ACE-*IT*** System is now ready to be restarted.

5.3 SYSTEM RECOVERY

If the system becomes unstable, it may be necessary for the user to reinitiate the system and restart the exercise without deleting the exercise log. Again, all **ACE-*IT*-**related tasks should be ended using the Windows® Task Manager. Move to the Moderator computer **ACE-*IT*** window, and double click on the icon labeled "Reset **ACE-*IT*** to Continue Current Scenario." When this procedure has finished running, shutdown and reboot all computers in the network. When all users are again logged onto the network and when all network drive connections have been properly established, restart the exercise as described in Section 2. Once the exercise is running, the Moderator should jump to the desired step, with no input from either the Inspection Team or Inspected Party computers. Once the desired exercise step has been reached, the participants may restart the exercise. The exercise log will record and show all events up to and prior to the system instability, as well as all those that occur after system restart, in their correct sequence. There will be a difference in the recorded scenario date/time, therefore the time remaining in the exercise should now be monitored by the Moderator to ensure that excessive time is not allowed for the interrupted event.

6.0 SUMMARY

ACE-*IT* provides trainees with a unique training experience, which is designed to enhance and improve their capabilities in conducting "challenge inspections" under the Chemical Weapons Convention. Specifically, **ACE-*IT*** can be used to teach

- how to collect information to determine compliance;
- how to balance the obligation to demonstrate compliance with the need to protect sensitive information that is unrelated to the Treaty;
- and how to manage time during an inspection, since the duration of an inspection is limited.

ACE-*IT* can also be used by policymakers to understand the implications of a "challenge inspection" regime.

All steps in the inspection regime are covered: from initial notification of an inspection — through negotiating the perimeter — to the actual inspection. But, the focus of training is on the actual inspection. Three buildings can be inspected: one for production of Chemical Weapons agent and two for its storage. Under the "challenge inspection" regime, the Inspected Party can control the movement of the inspectors by using "managed access." One way to "manage access" is to control physical access to the room by only allowing the inspectors to view the room through the window and the door. Another way to "manage access" is to control access to a shrouded (or covered) item, by partially removing the shroud or providing alternate information (such as chemical sampling) to assure the inspectors that the site is in compliance with the Treaty.

The **ACE-*IT*** system architecture provides for the rapid development of other inspection regimes or inspectable buildings. Long-range plans for system enhancements include the development of an Internet-capable version of the **ACE-*IT*** training program, which will provide users with instruction in the proper conduct of such inspections.

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